

The Book of Games

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FEBRUARY 1983

Wondering just what to do with the micro you got for Christmas? At a loose end when it comes to game ideas? Never fear — the Book of Games is here!

The *Computer and Video Games* office is regularly deluged with programs from readers — more than enough to keep the magazine full for the next few centuries. So in order to bring you some of the best games that we've received — but which have not been published within the pages of *C&VG* — we decided to put them together in this bumper bundle of post-Christmas fun.

All the games have been tried and tested by our busy team of reviewers so any bugs should be few and far between. We also tried to keep the programs short and sweet with the exception of World Cup. We thought it was worth giving more space to. It's a version of the game first published for the Sharp in our June issue — converted for the BBC machine. It proved popular with Sharp owners — so now BBC fans will get a chance to have a crack at the big match.

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Ace puzzler Stephen Shaw strikes again with this surprise package for the Texas TI 99/4A.	

The Book of Games is a supplement to Computer & Video Games magazine. Editorial and advertisement offices: Durrant House, 8, Herbal Hill, London EC1R 5LB. Telephone Editorial: 01-278 6556. Advertising 01-278 6552 Published and distributed by EMAP National Publications Limited. Typeset by Advantage Filmsetting. Printed by Eden Fisher (Southend) Limited. © Computer & Video Games Limited ISSN 0261 3697.

DRACULA

BY STUART EARL

RUNS ON A ZX81 IN 16K

Listen to the children of the night . . . how sweet they sound. Ahh, there you are my dearrrrs. We must return to our resting place in Castle Dracula.

But look! There's the priest again. He thinks he'll finish us this time. But we'll defeat him yet!

In this charming resurrection of the Dracula story you play the evil count who is returning to his castle after a night out. You must evade the priest and avoid the garlic to reach your castle before sunrise which will spell your doom.

The program includes full instructions and has a high score feature which allows players to enter their names.

```

1 LET Q=0
2 LET N$=""
3 FOR X=0 TO 21
4 PRINT "
5 NEXT X
6 PRINT AT 0,0:
7 LET D$=""
8 LET U=0
9 FOR X=1 TO 5
10 PRINT "
11 NEXT X
12 PRINT AT 0,27: "
13 PRINT AT 4,28: "
14 LET T=99
15 LET C=20
16 LET Z=2
17 LET D=1
18 LET A=INT (RND*10)+1
19 LET B=INT (RND*26)-1
20 LET H=6
21 LET G=25
22 LET X=INT (RND*20)+1
23 LET Y=EXP (RND*24)+1
24 LET E=INT (RND*20)+1
25 LET F=INT (RND*24)+1
26 LET I=INT (RND*20)+1
27 LET J=INT (RND*20)+1
28 LET K=INT (RND*24)+1
29 LET L=INT (RND*20)+1
30 LET M=INT (RND*24)+1
31 LET N=INT (RND*20)+1
32 PRINT AT C,D: "
33 PRINT AT A,B: "
34 PRINT AT X,Y: "
35 PRINT AT E,F: "
36 PRINT AT I,J: "
37 PRINT AT K,L: "
38 PRINT AT M,N: "
39 SLOW
40 IF INKEY$="1" THEN LET D$=""
41 IF INKEY$="0" THEN LET D$=""
42 IF D$="" THEN LET Z=2
43 IF D$="" THEN LET Z=1
44 LET C=C+(INKEY$="6")-(INKEY$="5")
45 LET D=D+(INKEY$="8")-(INKEY$="5")
46 PRINT AT C,C:D$
47 IF A>C AND U=0 THEN LET A=A-1
48 IF A<C AND U=0 THEN LET A=A+1
49 IF B>D AND U=0 THEN LET B=B-1
50 IF B<D AND U=0 THEN LET B=B+1
51 PRINT AT A,B: "+"
52 IF C=A AND D=B THEN GOTO 10
53 PRINT AT C-1,D+1: "
54 PRINT AT C+1,D+1: "
55 IF A<0 THEN LET A=2
56 IF A>20 THEN LET A=20
57 IF B<0 THEN LET B=24
58 IF B>24 THEN LET B=24
59 IF C<0 THEN LET C=20
60 IF C>20 THEN LET C=20
61 IF D<0 THEN LET D=2
62 IF D>30 THEN LET D=30
63 IF Z=1 THEN GOTO 520
64 IF (C=X AND D+1=Y) OR (C=E

```

```

AND D+1=F) OR (C=I AND D+1=J) OR
(C=K AND D+1=L) OR (C=M AND D+1
=N) THEN GOTO 1000
520 IF (A=X AND B+1=Y) OR (A=E
AND B+1=F) OR (A=I AND B+1=L)
A=K AND B+1=L) OR (A=M AND B+1=N
) THEN LET U=1
530 LET G=INT (RND*7)+24
540 PRINT AT H,G: "
550 IF C=H AND D+1=G+1 AND Z=2
THEN GOTO 1000
560 PRINT AT 0,0:T,AT 0,10:"HIG
H="
565 PRINT AT H,G: "
570 IF Z=2 THEN LET T=T-1
580 IF Z=1 THEN LET T=T-2
590 IF S=0 THEN GOTO 1000
600 IF C=4 AND D=27 THEN GOTO 2
610 GOTO 260
1000 PRINT "YOU ARE DEAD.SCOR=
"
1001 IF 100-T>0 THEN PRINT "NAME
1 TO 6 LETTERS"
1002 IF 100-T>0 THEN INPUT N$
1003 IF LEN N$>6 THEN GOTO 1001
1005 IF 100-T>0 THEN LET Q=100-T
1100 PRINT "ANOTHER GO:"
1200 IF INKEY$="" THEN GOTO 1200
1230 IF INKEY$<>"Y" THEN GOTO 12
00
1235 CLS
1240 GOTO 3
2000 PRINT "WELL DONE YOU XAVE A
REACHED THE CASTLE. SCORE="
2050 IF T*2>0 THEN PRINT "NAME 1
TO 6 LETTERS"
2060 IF T*2>0 THEN INPUT N$
2070 IF LEN N$>6 THEN GOTO 2050
2200 GOTO 1100 THEN LET Q=T*2
7000 PRINT "
7010 PRINT "
7020 PRINT "5=LEFT 8=RIGHT 6=D
OWN 7=UP"
7030 PRINT " YOU TAKE THE ROLE O
F DRACULA. YOU HAVE GOT 100 SEC
ONDS TO GET TO YOUR CASTLE. YOU
RE THE UVIPLAGERS HAVE D
UG PITS WHICH IS OUT TO GET
LY CROSS YOU MUST LURE THE HO
YOU INTO ONEIF YOU ARE SUCCESSFU
L HE WILL STOP IF NOT YOY ARE
DEAD. IF YOU ARE DEAD, "
YOU ARE DEAD, "
7050 PRINT " IF YOU PRESS 0 YOU
TURN INTO A BAT AND CANT FALL
IN A PIT WHIPE YOU ARE A BAT
S TWICE AS QUICK.PRESSING 1 TU
ANS YOU BACK IF DAYLIGHT BREAKS
YOU ARE DEAD"
7060 PRINT " IF YOU GET TO THE D
OUR WATCH OUT FOR THE SWINGING
"
7080 PRINT "PRESS N/L"
7090 INPUT A$
7095 CLS
8000 RUN
9000 SAVE "DRACULA"
9100 GOTO 7000

```


WORDFIND

```

5 OPEN #1,4,0,"K:"
10 DIM ANSWER$(20),GUESS$(1),ALPHABET$(26),USER$(20),CLUE$(15)
20 GOTO 500
30 GRAPHICS 7
35 COLOR 3
40 IF X>=1 THEN PLOT 20,79:DRAWTO 20,20
42 IF X>=2 THEN PLOT 10,79:DRAWTO 20,59:
DRAWTO 30,79
44 IF X>=3 THEN PLOT 20,30:DRAWTO 30,20
46 IF X>=4 THEN PLOT 20,20:DRAWTO 80,20
50 IF X>=5 THEN PLOT 65,20:DRAWTO 65,25:
FOR I=1 TO 35:COLOR 1:READ A,B:PLOT A,B:
NEXT I:RESTORE
60 DATA 63,26,64,26,65,26,66,26,67,26,62
,27,63,27,64,27,65,27,66,27,67,27,68,27,
62,28,63,28,65,28,67,28,68,28
70 DATA 62,29,63,29,64,29,66,29,67,29,68
,29,62,30,63,30,64,30,65,30,66,30,67,30,
68,30,63,31,67,31,64,32,65,32
80 DATA 66,32
90 IF X>=6 THEN COLOR 2:FOR I=61 TO 69:F
OR J=34 TO 44:PLOT I,J:NEXT J:NEXT I
100 IF X>=7 THEN COLOR 1:PLOT 60,34:DRAW
TO 57,39:DRAWTO 57,46:PLOT 60,35:DRAWTO
58,39:DRAWTO 58,46
110 IF X>=8 THEN COLOR 1:PLOT 70,34:DRAW
TO 73,39:DRAWTO 73,46:PLOT 70,35:DRAWTO
72,39:DRAWTO 72,46
120 IF X>=9 THEN COLOR 3:PLOT 61,45:DRAW
TO 69,45:FOR I=61 TO 64:COLOR 2:PLOT I,4
6:DRAWTO I,57:NEXT I
125 IF X>=9 THEN COLOR 3:PLOT 62,58:DRAW
TO 63,58:PLOT 61,59:DRAWTO 64,59
130 IF X=10 THEN COLOR 2:PLOT 65,46:DRAW
TO 65,50:FOR I=66 TO 69:PLOT I,46:DRAWTO
I,57:NEXT I
135 IF X=10 THEN COLOR 3:PLOT 67,58:PLOT
68,58:PLOT 66,59:DRAWTO 69,59
140 IF X<10 THEN 490
145 FOR T=1 TO 750:NEXT T
150 GRAPHICS 1+16:COLOR 1:SETCOLOR 0,0,0
:SETCOLOR 4,0,8:? #6;"THE ANSWER WAS "?:
#6:? #6:? #6;ANSWER$
160 FOR I=1 TO 5:FOR J=1 TO 200:SOUND 0,
J,8,10:NEXT J:SOUND 0,0,0,0:NEXT I
180 RUN
490 FOR T=1 TO 500+50*X:NEXT T:SOUND 0,0
,0,0:GOTO 600
500 ? "}>WORDFIND":? :POKE 752,1:? "Do yo
u want instructions (Y or N) ?":GET #1,K
510 IF CHR$(K)="Y" THEN GOSUB 1000
515 ANSWER$=""
520 POKE 752,1:? "}>INPUT YOUR WORDS":? "
(not more than 20 letters).":? "?"
522 FOR I=1 TO 20:GET #1,K:ANSWER$(I,I)=
CHR$(K):IF CHR$(K)="" THEN ANSWER$(I,I)
="" :GOTO 527

```

The object of Word Find is to guess the hidden word entered into the computer's memory by your opponent. You simply have to type in your choice of letters which will gradually reveal the secret word.

There is a catch however. Just like the pen and paper game Hangman an unfortunate character is gradually progressing toward his doom each time you make a wrong guess.

Will you be able to beat your opponent – and the Hangman – before the poor little chap starts to dangle?

The 's' character is a clear screen command and it appears in lines 500, 520 and 530. The 'c' in line 1035 should be typed in inverse video.

```

524 NEXT I
525 IF LEN(ANSWER$)>20 THEN 515
527 CLUE$=""
530 ? :? "}>INPUT YOUR CLUE":? "(not more
than 15 letters)":INPUT CLUE$
535 IF LEN(CLUE$)>15 THEN CLUE$="" :GOTO
527
540 USER$="" :FOR I=1 TO LEN(ANSWER$):USE
R$(I,I)="-":IF ANSWER$(I,I)=CHR$(32) THE
N USER$(I,I)=CHR$(32)
545 IF ASC(ANSWER$(I,I))<65 OR ASC(ANSWE
R$(I,I))>90 THEN USER$(I,I)=ANSWER$(I,I)
550 NEXT I
590 X=0:Y=1
600 GRAPHICS 2:COLOR 1
610 POSITION 0,3:? #6;USER$
620 POSITION 0,9:COLOR 2:? #6;"CLUE:";CL
UE$
630 ? :? "LETTERS USED:-";ALPHABET$:? "I
NPUT YOUR GUESS":GET #1,K:GUESS$=CHR$(K)
:ALPHABET$(Y,Y)=GUESS$:Y=Y+1
635 IF Y>26 THEN Y=26
640 FOR I=1 TO LEN(ANSWER$):IF GUESS$=AN
SWER$(I,I) THEN USER$(I,I)=GUESS$:Z=Z+1:
POSITION I-1,3:? #6;GUESS$:F=1
650 IF F=1 THEN GOTO 665
660 NEXT I:GOTO 670
665 FOR J=1 TO 20:SOUND 0,50,10,14:NEXT
J:SOUND 0,0,0,0:F=0:GOTO 660
670 IF USER$=ANSWER$ THEN GOTO 900
680 IF Z=0 THEN X=X+1:SOUND 0,200,4,12:G
OTO 30
690 Z=0
700 GOTO 630
900 ? "CORRECT"
910 GRAPHICS 2+16:FOR T=1 TO 4:FOR S=1 T
O 15:SETCOLOR 0,S,12/T:POSITION 0,3:? #6
;"CORRECT":SOUND 0,200/S,10,10
915 SETCOLOR 4,16-S,T:POSITION 0,6:? #6;
ANSWER$:SOUND 1,200/T,10,10
920 FOR TIME=1 TO 20:NEXT TIME
930 NEXT S:NEXT T
940 SOUND 0,0,0,0:SOUND 1,0,0,0:RUN
1000 ? :? "The object of WORDFIND is to
guess the";:? "hidden word entered by yo
ur opponent"
1010 ? :? "Your opponent must enter the
word(s) of his choice letter by letter
and press '*' to end it."
1020 ? :? "You must guess letters in tur
n. To do this simply type the letter of
your"
1025 ? "choice."
1030 ? :? "The computer will do the rest
."
1035 ? :? "PRESS C TO CONTINUE":GET #1,K
:IF CHR$(K)="C" THEN RETURN
1040 GOTO 1035

```

BY A. J. DAVIS

RUNS ON AN ATARI 400

IN 16K

INVADERS

BY ANDREW FILBY

RUNS ON A SPECTRUM IN 16K

Those nasty aliens are back again. And they are as dangerous as ever.

You can defend yourself using your laser base. But you can only fire three times at any one alien. The good news is that you can blast their missiles with your laser. The bad news is that those missiles will home in on you.

You may also use the life saving hyperspace button — but only six times. And each time you press the panic button your score decreases. The lower the alien is before you blast him the more you'll score — but you only have five lives to play with, so don't let them get too close! Use 'm' to move right, 'b' to go left, and 'n' to fire.

```

2 LET uy=0: LET lx=0: LET lo=
0: GO SUB 1000: PAPER 6: LET a$=
": CLS: LET hs=0: INK 2: BORDE
R 1
3 DATA 0,0,BIN 00110110,BIN 0
0110110,BIN 00011100,BIN 0001110
0,BIN 00011100,BIN 00001000
4 DATA BIN 10001001,BIN 00100
010,0,BIN 01011001,BIN 00001100,
BIN 10100000,BIN 00001000,BIN 10
100001
5 DATA BIN 00011000,BIN 00111
100,BIN 00111100,BIN 11111111,BI
N 11111111,BIN 11111111,BIN 1100
0011,BIN 11000011
6 DATA BIN 00111001,BIN 00111
111,BIN 00000011,BIN 11100011,BI
N 00011111,BIN 00011111,BIN 1111
0110,BIN 00000010,BIN 11100000,B
IN 11100000,BIN 00000100,BIN 000
11111,BIN 11111111,BIN 11111000,
0,0
7 LET sc=0: LET rt=0: LET li=
4
8 PRINT "SCORE:";sc
10 LET l=15
20 LET b=10
21 FOR a=144 TO 148
25 FOR f=0 TO 7: READ a: POKE
USR CHR$(a)+f,a: NEXT f
28 NEXT a
28 PRINT AT 8,15;"*":TAB 22;"*
*":TAB 25;"*":TAB 30;"*":
29 FOR g=1 TO 90
34 LET k=(RAND*10)+1
35 FOR u=0 TO 20
40 PRINT AT 21,l;"*":
50 PRINT AT k,u;"*"
51 IF sc<1 THEN LET sc=0
55 PRINT AT 8,5;sc
60 IF INKEY$="a" THEN GO TO 20
61 IF AND(.33) THEN GO TO 78
62 LET uy=0: LET lo=1
63 FOR c=INT lx+1,51 TO 21
64 PRINT AT c,uy;"v"
65 IF SCREEN$(c+1,uy)<>" " TH
EN GO TO 400
66 PRINT AT c,uy;" ": IF INKEY
$="n" THEN GO SUB 200
67 IF l<uy THEN LET uy=uy-1
68 IF l>uy THEN LET uy=uy+1
71 IF INKEY$="v" AND rt=5 THE
N GO TO 500
75 NEXT c: LET lo=0
79 PRINT AT k,u;" ":AT 21,l;
80 IF INKEY$="b" THEN LET l=l+
1.5
90 IF INKEY$="b" THEN LET l=l-
1.5
100 IF l=31 THEN LET l=33
110 IF l=5 THEN LET l=5
190 NEXT u
191 LET lx=0
195 NEXT g
199 STOP
200 PLOT 8*l+3,3
201 LET lx=lx+1
202 IF lx>3 AND lo=1 THEN RETUR
N
203 IF lx>3 THEN GO TO 61
205 BEEP .05,9
210 DRAW 0,ABS ((8.33333333*k)-
175)
230 PLOT 8*l+3,3
240 DRAW OVER 1,0,ABS ((8.33333
333*k)-175)
255 IF SCREEN$(k,l)<>" " THEN
GO TO 300
256 IF l<>uy AND lo=1 THEN RETU
RN
290 GO TO 61
300 PRINT AT k,l;"*"
310 FOR f=1 TO 9: BEEP .02,f: N
EXT f
315 LET sc=sc+INT (100*k)
320 PRINT AT k,l-1;" "
325 PRINT
330 GO TO 191
400 PRINT AT 8,li+5+10;" "
410 INK 9
420 PRINT AT 20,l;"E":AT 21,l-1
"
430 FOR f=-10 TO 10
440 BEEP .05,f
445 BORDER RND*6+1
450 NEXT f
455 PRINT AT k,u;" "

```

```

460 PRINT AT 20,l;" ":AT 21,l-1
"
465 INK 2
470 LET li=li-1
480 IF li=-1 THEN GO TO 500
490 GO TO 191
500 PRINT AT 10,9: INVERSE 1;"H
YPERSPACE": INVERSE 0
501 FOR f=10 TO 0 STEP -1
502 PRINT AT 21,l;" ":AT k,u;" "
510 BORDER RND*6+1: BEEP .02,f
520 NEXT f
530 BEEP 1,-10
535 LET l=RND*31
536 LET sc=sc-INT (100/k)*2
537 PRINT AT 10,9;" "
538 LET rt=rt+1
540 GO TO 191
500 PRINT AT 10,0: INVERSE 1;"
YOU SCORED ";sc;"
AND SURVIVED ";G;" ATTACK W
AVES " : INVERSE 0
801 IF sc>hs THEN PRINT "YOU HA
VE beaten ";a$;"'S HIGH SCORE OF
";hs: INPUT "please input name"
a$: LET hs=sc
802 PRINT a$;" has a high score
of ";hs
810 PRINT AT 21,0: INVERSE 1;"p
ress 'a' to play again": INVERSE
0
811 RESTORE
812 PAPER 6: BORDER 1
815 IF sc>hs THEN LET hs=sc
820 LET l$=INKEY$
840 IF l$="a" THEN CLS: GO TO
7
850 GO TO 220
1000 PAPER 1: CLS: INK 7
1004 PRINT TAB 4: INVERSE 1;"SPA
CE ATTACK--@-- A.FILBY": INVERSE
0
1010 PRINT "The object of the
game is to shoot down as many sp
ace ships (v) as possible from y
our laser base (*)."
1020 PRINT "At random the alien
s will fire at you, their bombs(
v) will home in on you. If one is
on target you can go into
HYPERSPACE to be safe, but it wil
l decrease your score. The lo
wer an alien is the more points
it is worth. You have 5 lives a
nd you can move from side to s
ide at 1.5 times as fast
as an alien."
1021 PRINT "You can use HYPERSPAC
E 6 times, but you can only fire
at any alien 3 times. your laser
can stop th bombs"
1040 PRINT "Use 'm' to move rig
ht, 'b' to move left and 'n' to fir
e"
1050 PRINT "'v' puts you into Hy
perspace"
1060 INPUT "press 'enter' to sta
rt":P$
1100 RETURN

```


MASTERMIND

Can you crack the hidden code? If you can you'll be really worthy of the title of C&VG mastermind!

The program plays the part of the code-maker in the popular game of Mastermind. One of its strongest features is the use of graphics, both in the initial display and in the depiction of the Mastermind board.

The idea behind the game for those unfamiliar with it, is that a code is set-up, which has to be discovered in as few attempts as possible. The difficulty factor may be altered in two ways.

Firstly the number letters in use may be varied. Secondly the number of positions in the code may be varied.

In this game the first option is the one used to provide different levels of play.

On RUNNING the program there is an initial graphic title frame (10-90, 2390-2410). Then there is a brief set of instructions (100-160).

Then the level of play can be entered by the user typing 1, 2 or 3.

```

10      REM* GRAPHIC DISPLAY *
20 CLS
30 FORX=1TO100:Z=0:PRINT@Z,".":NEXTX
40 FORX=0TO127:Y=0:SET(X,Y):Y=47:SET(X,Y):NEXTX
50 FORY=0TO47:X=0:SET(X,Y):X=127:SET(X,Y):NEXTY
60 FORZ=1TO266:READX:READY:SET(X,Y):NEXTZ
70 PRINT@904,"MASTER MIND   by Daniel Bishop, Copyright, 1982.;"
80 FORX=1TO1500:NEXTX
90 CLS
100     REM* INSTRUCTIONS *
110 PRINT"Master Mind - a game of logic... . ."
120 PRINT"The computer sets up randomly a four letter code. The object of the game is to deduce, by trial and error, the letters and their positions in the fewest possible goes. You may choose to play with 6, 8 or 10 letters."
130 PRINT"Level I   : A,B,C,D,E,F                               Level
II    : A,B,C,D,E,F,G,H                                       Level III : A,B,C,D,E,
F,G,H,I,J"
140 PRINT"Your score is shown thus: ";CHR$(143);"correct letter, correct position."
150 PRINT"                               ";CHR$(137);"correct letter, wrong position."
160 PRINT"Note: the positions of the scoring pegs bear no relation to the positions of the letters in the code. To resign during the game type R."
170     REM* SET UP CODE *
180 DEFSTRK,T
190 PRINT:PRINT"Do you wish to play at Level I (1), Level II (2), Level III (3)?";
200 L$=INKEY$:IF L$<>"1" AND L$<>"2" AND L$<>"3" THEN 200
210 IF L$="1" THEN L=6
220 IF L$="2" THEN L=8
230 IF L$="3" THEN L=10
240 FOR Z=1 TO 4
250 R=RND(L):IFR=1THENK(Z)="A"
260 IFR=2THENK(Z)="B"
270 IFR=3THENK(Z)="C"
280 IFR=4THENK(Z)="D"
290 IFR=5THENK(Z)="E"
300 IFR=6THENK(Z)="F"
310 IFR=7THENK(Z)="G"
320 IFR=8THENK(Z)="H"
330 IFR=9THENK(Z)="I"
340 IFR=10THENK(Z)="J"
350 NEXTZ
360     REM* DRAW BOARD *
370 CLS
380 FOR X=4TO39
390 SET(X,1):SET(X,46):SET(X,9):SET(X,10):SET

```

```

650 FOR X=106TO 123:SET(X,6):NEXTX
660 PRINT@94,"Go";
670 IFL=6THENLL$="I"
680 IFL=8THENLL$="II"
690 IFL=10THENLL$="III"
700 PRINT@117,"Level ";LL$;
710 G=0
720     REM* GO LOOP *
730 G=G+1
740 PRINT@286,"Please type in your four letters.;"
750 PRINT@97,G;
760 PRINT@414,"";
770 FOR Z=1 TO 4
780 T$=INKEY$:IFT$=""THEN 780
790 IF T$="R" THEN PRINT@414,"Do you wish to resign (Y/N)?";ELSE 820
800 Z$=INKEY$:IF Z$=""ORZ$<>"Y"ANDZ$<>"N"THEN 800
810 IF Z$="Y" THEN 1980 ELSE PRINT@414,"";

```

```

(X,16):SET(X,22):SET(X,28):SET(X,34)
):SET(X,40)
400 NEXTX
410 FOR X=21 TO39
420 SET(X,2):SET(X,3):SET(X,4)
430 NEXTX
440 FOR Y=1 TO 46
450 SET(4,Y):SET(39,Y)
460 NEXTY
470 FOR Y=1 TO 8: SET(21,Y):NEXTY
480 FOR Y=8 TO 41 STEP 3
490 Y=Y+1:SET(21,Y):Y=Y+1:SET(21,Y):Y=Y+1:SET(21,Y)
500 NEXTY
510 SET(21,45)
520 PRINT@68,"MASTER";:PRINT@132,"MIND";
530 FOR X=139TO146:PRINT@X,CHR$(143);:NEXTX
540 PRINT@147,CHR$(175);
550 V=260
560 W=269
570 FOR Y=1 TO 6
580 FOR X=-1 TO 6 STEP 2
590 PRINT@V+X,"0";
600 PRINT@W+X,"0";
610 NEXT X
620 V=V+128:W=W+128
630 NEXT Y
640 FOR X=60 TO 69:SET(X,6):NEXTX

```

```

820 IF L=6 THEN 860
830 IF L=8 THEN 850
840 IFT$<>"A"ANDT$<>"B"ANDT$<>"C"ANDT$<>"D"ANDT$<>"E"ANDT$<>"F"ANDT$<>"G"ANDT$<>"H"ANDT$<>"I"ANDT$<>"J"THEN 780 ELSE 870
850 IFT$<>"A"ANDT$<>"B"ANDT$<>"C"ANDT$<>"D"ANDT$<>"E"ANDT$<>"F"ANDT$<>"G"ANDT$<>"H"THEN 780 ELSE 870
860 IFT$<>"A"ANDT$<>"B"ANDT$<>"C"ANDT$<>"D"ANDT$<>"E"ANDT$<>"F"THEN 780
870 T(Z)=T$

```

BY DANIEL BISHOP

RUNS ON A TRS80 MODELS I AND III

IN 16K


```

880 IFG=1ANDZ=1THENPRINT@908,T$;
890 IFG=1ANDZ=2THENPRINT@910,T$;
900 IFG=1ANDZ=3THENPRINT@912,T$;
910 IFG=1ANDZ=4THENPRINT@914,T$;
920 IFG=2ANDZ=1THENPRINT@9780,T$;
930 IFG=2ANDZ=2THENPRINT@9782,T$;
940 IFG=2ANDZ=3THENPRINT@9784,T$;
950 IFG=2ANDZ=4THENPRINT@9786,T$;
960 IFG=3ANDZ=1THENPRINT@952,T$;
970 IFG=3ANDZ=2THENPRINT@954,T$;
980 IFG=3ANDZ=3THENPRINT@956,T$;
990 IFG=3ANDZ=4THENPRINT@958,T$;
1000 IFG=4ANDZ=1THENPRINT@9524,T$;
1010 IFG=4ANDZ=2THENPRINT@9526,T$;
1020 IFG=4ANDZ=3THENPRINT@9528,T$;
1030 IFG=4ANDZ=4THENPRINT@9530,T$;
1040 IFG=5ANDZ=1THENPRINT@9396,T$;
1050 IFG=5ANDZ=2THENPRINT@9398,T$;
1060 IFG=5ANDZ=3THENPRINT@9400,T$;
1070 IFG=5ANDZ=4THENPRINT@9402,T$;
1080 IFG=6ANDZ=1THENPRINT@9268,T$;
1090 IFG=6ANDZ=2THENPRINT@9270,T$;
1100 IFG=6ANDZ=3THENPRINT@9272,T$;
1110 IFG=6ANDZ=4THENPRINT@9274,T$;
1120 NEXT Z

```

```

1130 PRINT@414,"Do you wish to change them (Y/N)?";
1140 Z$=INKEY$;IF Z$=""ORZ$<>"Y"ANDZ$<>"N"THEN 1140
1150 IFZ$="Y"THEN 760

```

```

1160 REM* FIND SCORE *
1170 FOR Z=1 TO 4

```

```

1180 IF K(Z)="A"THENAK=AK+1
1190 IF K(Z)="B"THENBK=BK+1
1200 IF K(Z)="C"THENCK=CK+1
1210 IF K(Z)="D"THENDK=DK+1
1220 IF K(Z)="E"THENEK=EK+1
1230 IF K(Z)="F"THENFK=FK+1
1240 IF K(Z)="G"THENGK=GK+1
1250 IF K(Z)="H"THENHK=HK+1
1260 IF K(Z)="I"THENIK=IK+1
1270 IF K(Z)="J"THENJK=JK+1
1280 IFT(Z)="A"THENAT=AT+1
1290 IFT(Z)="B"THENBT=BT+1
1300 IFT(Z)="C"THENC=CT+1
1310 IFT(Z)="D"THENDT=DT+1
1320 IFT(Z)="E"THENET=ET+1
1330 IFT(Z)="F"THENFT=FT+1
1340 IFT(Z)="G"THENG=GT+1
1350 IFT(Z)="H"THENHT=HT+1
1360 IFT(Z)="I"THENIT=IT+1
1370 IFT(Z)="J"THENJT=JT+1
1380 NEXTZ
1390 FORZ=1TO4
1400 IFK(Z)<>T(Z)THEN 1510
1410 IF K(Z)="A"THENAK=AK-1:AT=AT-1:CC=CC+1
1420 IF K(Z)="B"THENBK=BK-1:BT=BT-1:CC=CC+1
1430 IF K(Z)="C"THENCK=CK-1:CT=CT-1:CC=CC+1
1440 IF K(Z)="D"THENDK=DK-1:DT=DT-1:CC=CC+1
1450 IF K(Z)="E"THENEK=EK-1:ET=ET-1:CC=CC+1
1460 IF K(Z)="F"THENFK=FK-1:FT=FT-1:CC=CC+1
1470 IF K(Z)="G"THENGK=GK-1:GT=GT-1:CC=CC+1
1480 IF K(Z)="H"THENHK=HK-1:HT=HT-1:CC=CC+1
1490 IF K(Z)="I"THENIK=IK-1:IT=IT-1:CC=CC+1
1500 IF K(Z)="J"THENJK=JK-1:JT=JT-1:CC=CC+1
1510 NEXT Z

```

```

1520 IFAK>0ANDAT>0THEN 1530 ELSE 1540
1530 IFAK<=ATTHENCW=CW+AKELSECW=AT
1540 IFBK>0ANDBT>0THEN 1550 ELSE 1560
1550 IFBK<=BTTHENCW=CW+BKELSECW=BT
1560 IFCK>0ANDCT>0THEN 1570 ELSE 1580
1570 IFCK<=CTTHENCW=CW+CKELSECW=CT
1580 IFDK>0ANDDT>0THEN 1590 ELSE 1600
1590 IFDK<=DTTHENCW=CW+DKELSECW=DT
1600 IFEK>0ANDET>0THEN 1610 ELSE 1620
1610 IFEK<=ETTHENCW=CW+EKELSECW=ET
1620 IFFK>0ANDFT>0THEN 1630 ELSE 1640
1630 IFFK<=FTTHENCW=CW+FKELSECW=FT
1640 IFGK>0ANDGT>0THEN 1650 ELSE 1660
1650 IFGK<=GTTHENCW=CW+GKELSECW=GT
1660 IFHK>0ANDHT>0THEN 1670 ELSE 1680
1670 IFHK<=HTTHENCW=CW+HKELSECW=HT
1680 IFIK>0ANDIT>0THEN 1690 ELSE 1700
1690 IFIK<=ITTHENCW=CW+IKELSECW=IT
1700 IFJK>0ANDJT>0THEN 1710 ELSE 1720
1710 IFJK<=JTTHENCW=CW+JKELSECW=JT
1720

```

```

REM* PRESENT SCORE *
1730 IF CC=0 AND CW=0 AND G<>6 THEN GOSUB 1950 :GOTO 720
1740 IF CC=0 AND CW=0 AND G=6 THEN 2190
1750 IF G=1 THEN S(1)=899:S(2)=901:S(3)=903:S(4)=905
1760 IF G=2 THEN S(1)=771:S(2)=773:S(3)=775:S(4)=777
1770 IF G=3 THEN S(1)=643:S(2)=645:S(3)=647:S(4)=649
1780 IF G=4 THEN S(1)=515:S(2)=517:S(3)=519:S(4)=521
1790 IF G=5 THEN S(1)=387:S(2)=389:S(3)=391:S(4)=393
1800 IF G=6 THEN S(1)=259:S(2)=261:S(3)=263:S(4)=265
1810 W=CC

```

```

1820 IF CC=0 THEN 1870
1830 FOR Z=1 TO 4
1840 PRINT@S(Z),CHR$(143);:CC=CC-1
1850 IF CC=0 THEN 1870
1860 NEXTZ
1870 IF CW=0 THEN 1920
1880 FOR Z=4 TO 1 STEP -1
1890 PRINT@S(Z),CHR$(137);:CW=CW-1
1900 IF CW<=0 THEN 1920
1910 NEXT Z
1920 IF W=4 THEN 2030
1930 IF G=6 THEN 2190
1940 GOSUB 1950 : GOTO 1970
1950 W=0:CC=0:CW=0:AT=0:BT=0:CT=0:DT=0:ET=0:
FT=0:GT=0:HT=0:IT=0:JT=0:AK=0:BK=0:C
K=0:DK=0:EK=0:FK=0:GK=0:HK=0:IK=0:JK=0
1960 RETURN
1970 GOTO 720
1980 REM* RESIGNING *
1990 PRINT@286,"You have resigned. ";
2000 PRINT@414," ";
2010 GOTO 2240
2020 REM* WINNING *
2030 PRINT@286,"You have won! Congratulations. ";
2040 Z=414

```

```

2050 IFG=1THENPRINT@Z,"That's incredible. The odds of ";
2060 IF L=6 THEN O=1296
2070 IF L=8 THEN O=4096
2080 IF L=10 THENO=10000
2090 IF G=1THENPRINT@Z+64,"getting that correct were ";
2100 IF G=1THENPRINT@Z+127,0;" to one. Go and see an ESP ";
2110 IF G=1THENPRINT@Z+192,"specialist. ";
2120 IF G=2THENPRINT@Z,"Wow! That's really amazing. ";
2130 IF G=3THENPRINT@Z,"You should go professional. ";
2140 IF G=4THENPRINT@Z,"You're very good. ";
2150 IF G=5THENPRINT@Z,"You're good. ";
2160 IF G=6THENPRINT@Z,"Phew! By the skin of your teeth. ";
2170 IFG<>1THENPRINT@Z+128," ";
2180 GOTO 2240
2190 REM* LOSING *
2200 PRINT@286,"You have lost! Maybe better luck. ";
2210 PRINT@350,"next time. ";
2220 PRINT@414," ";
2230 REM* GAME OVER *
2240 FOR X=60 TO 77:SET(X,6):NEXT X
2250 PRINT@94,"Game over";
2260 FOR X=139 TO 146:PRINT@X,CHR$(128);:NEXTX
2270 PRINT@147,CHR$(170);
2280 PRINT@140,K(1);:PRINT@142,K(2);:PRINT@144,K(3);:PRINT@146,K(4);
2290 FOR Z=0 TO 2000:NEXTZ

```

```

2300 PRINT@926,"Do you wish to play again (Y/N)?";
2310 Z$=INKEY$;IFZ$=""ORZ$<>"Y"ANDZ$<>"N"THEN 2310
2320 IF Z$="N"THENCLS:END
2330 G=0:GOSUB 1950 : CLS:GOTO 190

```



```

2340 REM* DATA FOR GRAPHICS DISPLAY *
2350 DATA4,21,5,21,6,20,6,21,6,22,6,23,6,24,6,25,6,26,5,27,4,27,3,28,2,28,1,28,0
,28,7,24,7,23,8,22,9,21,10,20,11,19,12,19,13,18,14,18,15,18,16,18,16,19,16,20,15
,21,15,22,14,23,14,24,13,25,16,21,17,20,18,19,19,18,20,17,21,17,22,16,23,16,24,1
5,25
2360 DATA15,26,15,27,16,26,17,25,18,24,19,24,20,23,21,23,22,23,23,24,23,25,22,26
,21,27,21,28,20,29,20,30,19,31,18,32,18,33,18,29,21,30,21,31,21,32,20,33,20,34,2
0,34,19,34,18,35,20,36,20,37,19,38,18,39,17,40,16,41,16,41,17,42,18,41,19,40,19,
39,19
2370 DATA43,17,44,16,45,15,46,14,46,13,47,12,47,11,48,10,45,17,46,17,47,17,48,16
,49,16,50,16,51,15,52,15,53,15,54,14,55,13,54,13,53,13,52,13,51,14,50,15,49,15,4
9,17,50,17,51,17,52,17,53,17,54,17,55,16,56,15,57,14,58,13,59,12,59,13,59,14,58,
15,58
2380 DATA16,60,13,61,12,62,12,63,12,64,11,65,11,66,11,67,11,68,11,69,10,45,13,47
,13,48,12,49,12,50,12,51,11,52,11,58,23,59,22,60,21,61,21,61,22,61,23,61,24,61,2
5,61,26,60,27,59,28,58,29,57,29,56,29,55,30,54,30,53,30,52,30,51,30,50,31,49,31,
48,31,47
2390 DATA31,62,24,63,23,64,22,65,21,66,21,67,20,68,20,69,20,69,21,69,22,69,23,69
,24,68,25,67,26,67,27,66,28,70,23,71,22,72,21,73,20,74,19,75,19,76,19,77,19,77,2
0,77,21,76,22,75,23,75,24,74,25,74,26,75,26,76,26,77,26,78,25,79,25,80,24,81,23,
82,22
2400 DATA82,23,82,24,82,25,83,25,84,24,85,23,86,23,87,22,88,22,89,21,90,21,90,22
,89,23,88,24,91,21,92,20,93,20,94,20,95,20,96,20,96,21,96,22,97,22,98,21,99,21,1
00,20,101,20,102,19,103,18,104,18,105,18,106,18,107,18,108,18,102,21,103,21,104,
21
2410 DATA105,20,106,19,107,19,108,17,109,16,109,15,110,14,108,19,109,19,110,19,1
11,19,112,18,113,18,114,18,115,18,116,17,117,17,118,17,119,17,120,16,121,16,122,
16,123,16,124,15,125,15,126,15,127,15,84,20

```

REACTION

BY J. STANTON

& J. WILKINSON

RUNS ON AN UNEXPANDED VIC-20

Want to hone your reactions for those games of Defender, Frogger — and of course, Pengo — down at your local arcade? Well here's the game that will test your mind to eye powers to the full.

The rules are simple. All you have to do is wait for a dot to appear on the screen, a noise

from your computer and the screen colour to change. As soon as this happens you must the space bar.

Your reaction time is flashed up, and there is also a high score feature which you set with your first attempt.

Further attempts receive com-

ments from your computer and a suitable jingle. Instructions are included in the program which uses the Vic's sound, visual, and colour facilities to the full and should provide a good test to skill for any arcade fan willing to take a break from blasting multi-coloured aliens!

```

1 V=25:POKE36878,6:PRINTCHR$(14):POKE36879,27
2 GOTO5000
3 Q=0
4 GOTO4000
5 PRINT"J"
6 R=INT(RND(TI)*800)
7 G=INT(RND(TI)*400)+100
8 PRINT"HERE IS A MESSAGE..." :FORA=1TO1300:NEXTA:POKE36879,250
9 FORL=1TO400:IFPEEK(197)=32THENGOTO6000:NEXTL:PRINT"J"
20 POKE7680+G,160
22 POKE36876,200
30 POKE38400+G,0
32 FORA=1TO50:NEXTA:POKE36876,0
35 F=TI
40 PRINT"J"
50 IFPEEK(197)=32THENGOTO105
60 GOTO50
105 PRINT"REACTION TIME:"
106 X=(TI-F)/60
110 PRINT"X:" #EC."
120 IFO=1ANDXC=VTHENGOSUB1000
125 IFO=1ANDX>VTHENGOSUB2000
126 IFX<VTHENV=X
130 PRINT"TEST TIME:"
135 PRINT"V:" #EC."
140 FORI=1TO2000:POKE36879,27:NEXTI

```


REACTION

```

150 X=0:0=1:GOTO5
1000 POKE36876,225
1005 PRINT"OELL",
1006 FORA=1TO100:NEXTA
1010 POKE36876,210
1015 FORA=1TO75:NEXTA
1016 POKE36876,0
1020 POKE36876,210
1022 PRINT"ONE",
1025 FORA=1TO100:NEXTA
1030 POKE36876,215
1033 PRINT"Y",
1035 FORA=1TO100:NEXTA
1040 POKE36876,210
1043 PRINT"LD":

```

```

1045 FORA=1TO200:NEXTA
1050 POKE36876,220
1053 PRINT"ON,",
1055 FORA=1TO125:NEXTA
1056 POKE36876,0
1060 POKE36876,222
1063 PRINT"OELL",
1065 FORA=1TO200:NEXTA
1073 PRINT"ONE!"
1120 POKE36876,0
1130 RETURN
2000 POKE36875,128
2005 PRINT"AS IARD",
2010 FORA=1TO400:NEXTA
2020 POKE36875,0
2100 POKE36874,128

```

REACTION

```

2105 PRINT"LUCK",
2110 FORA=1TO400:NEXTA
2111 PRINT" -HUM"
2115 POKE36875,128
2116 FORA=1TO400:NEXTA
2220 POKE36875,0:POKE36874,0:RETURN
4000 POKE36879,249:PRINT"REACTION!"
4010 PRINT"-----"
4020 PRINT"X A -IRCLE WILL APPEAR"
4030 PRINT"X IN THE *CREEN *ND *"
4040 PRINT"X /OISE WILL *OUND..."
4050 PRINT"X YOU JUST HIT THE "
4060 PRINT"X *FACE* *IAR*",
4070 PRINT" *S -AST "
4080 PRINT"X *S YOU -AN...."
4200 PRINT"X ***** 1000 LUCK!"
4500 FORR=1TO7000:NEXTR
4600 GOTO5
5000 PRINT"*****INSTRUCTIONS?"
5100 PRINT"***** (Y/N)"
5200 GETA$
5300 IFA$="Y" THEN GOTO4
5310 IFA$="N" THEN 5
5350 GOTO5200
6000 PRINT"*****YOU CHEATED!!*****TRY AGAIN"
6050 FORA=1TO2000:NEXTA:PRINT"J"
6100 GOTO5

```


PYRAMID OF SECRETS

BY STEVE HOLLOWAY



RUNS ON A TRS-80 IN 16K

The builders of those ancient pyramids were crafty people. They used every devious means available to them to protect the treasures of the Pharaoh buried deep with the vaults of their awesome creation.

Trap doors, dead ends, false passageways — these ancient architects employed all the tricks of their trade to make sure no-one could rob the tombs lined with gold and glittering jewels.

Will you dare to enter the pyramid of secrets and search for the treasures which are hidden there? Will you manage to escape once you have found the glittering prize? Or will you gradually starve to death — trapped within the stone corridors of this ancient maze . . .

This is a game for one player. You will be presented with a 3D representation of a maze in which you must move around in.

There are six levels to explore in search of the treasure. But beware of trap doors — and walls that may look solid, but which may slide open if you move forward into them. The trap doors will drop you back to a lower level — and the entrance to the pyramid is one of those moving blocks of stone and may be difficult to find again. There is also a time limit on the game — after it has run out you are presumed dead.

Program notes:

10-80: Input routine and timer advance

100-200: Help routine: gives player's direction, level,

treasure and indicates if a moveable wall is nearby

500-530: Solid wall message and open wall routine.

1020-1050: Move player forward.

3000-3020: Routine for finding walls present and whether stairs, trapdoor, treasure.

```

5 GOTO 6000
10 GOSUB3030:PRINT@0,"WHICH WAY? (F,L,R,H) :-";:PRINT@48,"TIME LEFT -";
20 I$=INKEY$:PRINT@25,I$;:T=T+1:IFT>10000THENCLS:PRINT@520,"SORRY - BUT YOU RAN
OUT OF TIME AND STARVED TO DEATH.":END
30 IFI$="F"GOTO500
40 IFI$="L"THENEND=D-1:IFD<1THENEND=4:GOTO10ELSE10
50 IFI$="R"THENEND=D+1:IFD>4THENEND=1:GOTO10ELSE10
60 IFI$="H"THENGOSUB100:GOTO10
70 PRINT@59,100-INT(T/100);
80 GOTO20
100 REM HELP ROUTINE
110 CLS:PRINTTAB(10)"YOU ARE ON LEVEL -";LV:PRINTTAB(10)"(THE EXIT IS ON LEVEL 3
)":PRINT"YOU HAVE ";SC;" POUNDS OF TREASURE"
120 PRINTTAB(10)"YOU ARE FACING ";:OND GOTO130,140,150,160
130 PRINT"NORTH":GOTO170
140 PRINT"EAST":GOTO170
150 PRINT"SOUTH":GOTO170
160 PRINT"WEST":GOTO170
170 PRINT"(THE EXIT IS ON THE EAST SIDE OF THE PYRAMID)"
180 IF A(X,Y,LV)>511PRINT"THERE IS A MOVEABLE WALL NEXT TO YOUR PRESENT POSITION
"
190 PRINT:PRINT:PRINT"PRESS ANY KEY TO CONTINUE PLAY (NOTE TIME IS SLIPPING BY)"
200 PRINT@48,"TIME LEFT -";100-INT(T/100);:T=T+5:I$=INKEY$:IFI$=""THEN 200 ELSE
RETURN
500 A=X:B=Y:GOSUB3000:IFFW=0THEN1020
510 IFFW>0ANDF=0THENPRINT@530,"THIS IS A SOLID WALL !!!";:FORI=1TO1000:NEXTI:PRI
NT@530," ";:GOTO20
520 PRINT@530,"THE WALL OPENS -";:FORI=179TO160STEP-1:PRINT@I,V0$;:FORJ=1TO50:NE
XTJ:NEXTI
530 CLS:PRINT@530,"AND CLOSES BEHIND YOU....":FORI=1TO1000:NEXT
1020 IFD=1THENY=Y-1:GOTO10
1030 IFD=2THENX=X+1:GOTO10
1040 IFD=3THENY=Y+1:GOTO10
1050 X=X-1:GOTO10
1060 IFD=1THENB=B-1:RETURN
1070 IFD=2THENA=A+1:RETURN
1080 IFD=3THENB=B+1:RETURN

```




```

1090 A=A-1:RETURN
3000 NW=A(A,B,LV)AND2:WW=A(A,B,LV)AND1:EW=A(A,B,LV)AND4:SW=A(A,B,LV)AND8:FW=NW:R
W=EW:LW=WW:BW=SW:ST=A(A,B,LV)AND96:TR=A(A,B,LV)AND16:PI=A(A,B,LV)AND128:IFD=1THE
N3020
3010 FORI=1TOD-1:Z=FW:FW=RW:RW=BW:BW=LW:LW=Z:NEXTI
3020 F=A(X,Y,LV)AND(FW*512):RETURN
3030 IFA(X,Y,LV)=769THEN5500ELSEA=X:B=Y:GOSUB3000:IFPI>0ANDRND(9)=4THENGOSUB5600
:GOTO10
3040 IFST=64THENCLS:LV=LV-1:PRINT@520,"GOING UP STAIRS":GOSUB7050:GOTO1020ELSEIF
ST=32THENCLS:LV=LV+1:PRINT@520,"GOING DOWNSTAIRS":GOSUB7050:GOTO1020
3050 IFTR>0THENSC=SC+RND(10)*10:CLS:PRINT@520,"YOU HAVE COLLECTED MORE RARE TREA
SURES,
YOU NOW HAVE";SC;"POUNDS":A(X,Y,LV)=A(X,Y,LV)-16:GOSUB7050:GOTO10
3060 CLS:PRINT@141,V0$;:PRINT@179,V0$;:IFLW>0PRINT@74,XA$;:PRINT@970,XB$;ELSEPRI
NTE@129,W3$;:PRINT@897,W4$;
3070 IFRW>0PRINT@116,XB$;:PRINT@1012,XA$;ELSEPRINT@180,W3$;:PRINT@948,W4$;
3080 IFFW>0PRINT@142,W1$;:PRINT@910,W2$;:RETURN
3090 GOSUB1060:GOSUB3000
3100 IFST=32PRINT@540,S1$;:RETURNELSEIFST=64PRINT@540,S2$;:RETURN
3110 IFLW>0PRINT@142,XC$;:PRINT@910,XE$;ELSEPRINT@334,W7$;:PRINT@718,W8$;
3120 IFRW>0PRINT@299,XD$;:PRINT@811,XF$;ELSEPRINT@363,W7$;:PRINT@747,W8$;
3130 IFTR>0PRINT@861,TR$;
3150 PRINT@342,V1$;:PRINT@362,V1$;:IFFW>0THENPRINT@343,W5$;:PRINT@727,W6$;:RETUR
N
3160 GOSUB1060:GOSUB3000:
3170 IFST=32THENPRINT@540,S1$;:RETURNELSEIFST=64PRINT@540,S2$;:RETURN
3180 IFLW>0PRINT@343,XG$;:PRINT@727,XH$;ELSEPRINT@407,WA$;:PRINT@663,WA$;
3190 IFRW>0PRINT@423,XI$;:PRINT@679,XJ$;ELSEPRINT@423,WA$;:PRINT@679,WA$;
3200 PRINT@410,V3$;:PRINT@422,V3$;:IFTR>0PRINT@733,TR$;
3210 IFFW>0PRINT@411,W9$;:PRINT@667,W9$;:RETURN
3220 GOSUB1060:GOSUB3000:IFST=32PRINT@540,S1$;:RETURNELSEIFST=64PRINT@540,S2$;:R
ETURN
3230 IFLW>0PRINT@411,CHR$(176);CHR$(26);CHR$(131);:PRINT@667,CHR$(131);CHR$(27);
CHR$(176);ELSEPRINT@475,CHR$(140);CHR$(140);:PRINT@603,CHR$(140);CHR$(140);
3240 IFRW>0PRINT@484,CHR$(131);CHR$(27);CHR$(176);:PRINT@612,CHR$(176);CHR$(26);
CHR$(131);ELSEPRINT@484,CHR$(140);CHR$(140);:PRINT@612,CHR$(140);CHR$(140);
3260 PRINT@477,CHR$(188);CHR$(24);CHR$(26);V$;CHR$(143);:PRINT@483,CHR$(188);CHR
$(24);CHR$(26);V$;CHR$(143);
3270 IFFW>0PRINT@478,STRING$(5,140);:PRINT@606,STRING$(5,140);:RETURNELSEPRINT@4
78,CHR$(176);CHR$(26);CHR$(179);CHR$(32);CHR$(179);CHR$(27);CHR$(176);:PRINT@606
,CHR$(131);:PRINT@610,CHR$(131);:RETURN
4000 RETURN
5500 CLS:PRINT@520,"YOU ARE OUT !":PRINT:PRINT"          TIME LEFT";32-INT(T/1000):
PRINT:PRINT"          TREASURE COLLECTED -";SC;"POUNDS":IF SC>200 PRINT"          TRULY
EXCELLÉNT !":ENDELSE PRINT"YOU DID WELL TO ESCAPE.":END
5600 CLS:PRINT"  YOU HAVE STEPPED ON A MOVEABLE TRAPDOOR AND ARE":FORI=154TOD1020
STEP64:PRINT@I,"FALLING";:FORJ=1TOD30:NEXTJ:PRINT@I,"          ":NEXTI:LV=LV+1:RETU
RN
6000 CLEAR 900:DEFINTA-Z:DIMA(11,11,6):CLS:PRINT@282,"T H E":PRINT@406,"P Y R A
M I D":PRINT@532,"O F S E C R E T S"
6010 PRINT@588,"";:FORI=1TOD8:PRINT"/ ";CHR$(27);:NEXTI:PRINT"/ ";CHR$(92);" ";CHR
$(26);:FORI=1TOD8:PRINTCHR$(92);CHR$(32);CHR$(26);:NEXTI:PRINT@640,STRING$(64,"-")
)
6020 PRINT@780,"WRITTEN BY STEVE HOLLOWAY,  FEB  1982":LV=5:A(6,5,1)=23:A(9,6,3)
=769
6030 N1=7-LV:N2=12-N1:FORX=N1TON2:FORY=N1TON2:READA:A(X,Y,LV)=A:NEXTY:NEXTX:LV=L
V-1:IFLV>0THEN6030
6040 W1$=STRING$(37,131):W2$=STRING$(37,176):W3$=STRING$(12,131):W4$=STRING$(12,
176):XA$=CHR$(131)+CHR$(140)+CHR$(176):XB$=CHR$(176)+CHR$(140)+CHR$(131):PRINT"P
RESS 'I' FOR INSTRUCTIONS OR ANY OTHER KEY TO CONTINUE"
6050 I$=INKEY$:IFI$=""THEN6050ELSEPRINT"JUST A MOMENT":IFI$="I"GOSUB8000
6060 V$=CHR$(191)+CHR$(26)+CHR$(24):FORI=1TOD13:V0$=V0$+V$:NEXTI:XC$=CHR$(140)+CH
R$(176)+CHR$(26)+XA$+CHR$(26)+XA$:XD$=XB$+CHR$(27)+XB$+CHR$(27)+CHR$(176)+CHR$(1
40)
6070 XE$=CHR$(140)+CHR$(131)+CHR$(27)+XB$+CHR$(27)+XB$:XF$=XA$+CHR$(26)+XA$+CHR$
(26)+CHR$(131)+CHR$(140):FORI=1TOD7:V1$=V1$+V$:NEXTI:W7$=STRING$(8,131):W8$=STRIN
G$(8,176):W5$=STRING$(19,131):W6$=STRING$(19,176)
6080 S1$="STAIRS"+CHR$(26)+STRING$(5,24)+"DOWN":S2$="STAIRS"+CHR$(26)+STRING$(4,
24)+"UP":TR$="TREASURE"
6090 W9$=STRING$(11,140):WA$=STRING$(3,140):V3$=CHR$(188)+CHR$(26)+CHR$(24)+V$+V
$+V$+CHR$(143):XG$=CHR$(140)+CHR$(176)+CHR$(26)+CHR$(131):XH$=CHR$(140)+CHR$(131
)+CHR$(27)+CHR$(176):XI$=CHR$(131)+CHR$(27)+CHR$(176)+CHR$(140)

```



```

6100 XJ$=CHR$(176)+CHR$(26)+CHR$(131)+CHR$(140)
6110 FORI=1TO11:FORJ=1TO11:READA:A(I,J,6)=A:NEXTJ:NEXTI
6120 PRINTTAB(8)"PRESS (F) TO OPEN ENTRANCE AND START EXPLORING"
6980 D=4:X=9:Y=6:LV=3:SC=0:T=0
6990 I$=INKEY$:IFI$="F"THENCLS:GOTO520ELSE6990
7000 DATA3,5,1,5,5,5,9,3,9,2,13,2,5,5,9,14,64,10,14,64,10,3,13,2,9,3,8,3,12,2,12
,7,8,10,10,10,2,5,8,3,29,10,6,12,14,10,11,14,2,5,12,3,1,9,10,6,1,8,3,1,12,10,10,
2,29,14,10,32,10,2063,10,10,6,5,13,6,5,12,519,12,32
7010 DATA19,133,5,5,2053,13,32,32,3,5,9,515,5,12,3,8,7,12,10,64,9,10,6,5,5,4,5,8
,6,1,5,13,7,5,8,11,2062,64,1,13,11,10,6,517,5,4,5,140,14
7020 DATA3,1,5,133,13,10,6,9,64,32,6,137,2,133,9,3,12,2,141,10,6,32,2062,6,12,3,
5,32,10,64,9,6,5,140,32
7030 DATA7,9,23,5,5,5,1,1,5,5,9,27,6,9,7,5,9,14,10,11,7,8,10,11,6,5,9,2,5,8,2,29
,10,10,2,1,4109,1034,10,27,10,6,5,8,10,10,10,3,12,10,6,12,3,5,12,6,12,10,10,7,0,
5,9,14,3,9
7040 DATA3,5,8,6,5,12,11,6,5,12,10,10,7,4,5,1,13,6,1,5,5,12,6,5,9,3,12,64,7,4,1,
5,9,3,29,10,2,5,12,3,29,10,64,10,6,5,12,6,5,13,6,5,12,6,12
7050 FORI=1TO1000:NEXTI:CLS:RETURN
8000 CLS:PRINTTAB(10)"P Y R A M I D   O F   S E C R E T S":PRINT:PRINT"YOU ARE O
UTSIDE THE ENTRANCE OF THE PYRAMID. IN A MOMENT YOU
CAN ENTER AND FIND YOUR WAY AROUND."
8010 PRINT"THERE ARE TEN TREASURES TO FIND AND MINOR HAZARDS TO AVOID
THERE ARE SOME TRAPS IN THE FLOOR WHICH WILL DROP YOU TO THE      LEVEL BELOW SOME
TIMES AND THERE ARE WALLS WHICH LOOK SOLID BUT"
8020 PRINT"WHICH WILL ALLOW YOU THROUGH IF YOU MOVE FORWARD INTO THEM. YOU CONT
ROL YOUR WAY THROUGH THE PYRAMID USING -
      (F) FOR FORWARD,  (R) TO TURN RIGHT,  (L) TO TURN LEFT
      (H) WILL TELL YOU THE LEVEL YOU ARE ON AND
8030 PRINT"THE DIRECTION YOU ARE FACING BUT REDUCE YOUR TIME.
YOUR TIME IS LIMITED SO DON'T TAKE TOO LONG PONDERING !":RETURN

```

SSSNAKES

BY STEVEN JERATH

RUNS ON AN ATARI 400 IN 16K

Are you a slippery customer? Then here's your chance to prove it. The aim of this two player game is to trap your opponent in the coils of your snake while at the same time avoiding getting trapped yourself.

You cannot go back on yourself or touch your own line. You must not touch your opponent's line. Also you have to stay away from the stars which dot the screen - and of course you must stay away from the walls.

```

5 GOSUB 2000
10 GRAPHICS 7+16:V1=0:V2=0:H1=1:H2=-1
11 SETCOLOR 2,7,8
13 FOR AAA=1 TO 20:COLOR 3:PLOT INT(RND(
0)*160),INT(RND(0)*96):NEXT AAA
20 X1=10:Y1=40:X2=140:Y2=40
29 COLOR 3:PLOT 0,0:DRAWTO 159,0:DRAWTO
159,95:DRAWTO 0,95:DRAWTO 0,0
30 A=STICK(0)
31 B=STICK(1)
50 IF A=14 THEN V1=-1:H1=0
51 IF A=13 THEN V1=1:H1=0
52 IF A=11 THEN V1=0:H1=-1
53 IF A=7 THEN V1=0:H1=1
60 IF B=14 THEN V2=-1:H2=0
61 IF B=13 THEN V2=1:H2=0
62 IF B=11 THEN V2=0:H2=-1
63 IF B=7 THEN V2=0:H2=1
70 X1=X1+H1:Y1=Y1+V1
80 X2=X2+H2:Y2=Y2+V2
81 IF X1=X2 AND Y1=Y2 THEN 300
85 LOCATE X1,Y1,ZZ:IF ZZ<>0 THEN 100
86 LOCATE X2,Y2,ZZ:IF ZZ<>0 THEN 200
90 COLOR 1:PLOT X1,Y1
91 COLOR 2:PLOT X2,Y2
92 POKE 53279,0
95 GOTO 30
100 GRAPHICS 1+16
101 POKE (PEEK(560)+256*PEEK(561))+3,64+
7:SETCOLOR 2,7,10

```

```

102 ? #6;"      PLAYER 1 LOSES"
103 R2=R2+1:IF R2>9 THEN 500      SCORES"
104 ? #6:?" #6:?" #6;"
105 ? #6;"      player 1-";R1:?" #6;"
player 2-";R2
150 FOR S=0 TO 250:SOUND 0,S,10,10:NEXT
S:SOUND 0,0,0,0
190 ? #6:?" #6:?" #6;"      hit any key "
199 GET #1,K:GOTO 10
200 GRAPHICS 1+16
201 POKE (PEEK(560)+256*PEEK(561))+3,64+
7:SETCOLOR 2,7,10
202 ? #6;"      PLAYER 2 LOSES"
203 R1=R1+1:IF R1>9 THEN 600      SCORES"
204 ? #6:?" #6:?" #6;"
205 ? #6;"      player 1-";R1:?" #6;"
player 2-";R2
250 FOR S=0 TO 250:SOUND 0,S,10,10:NEXT
S:SOUND 0,0,0,0
290 ? #6:?" #6:?" #6;"      hit any key "
299 GET #1,K:GOTO 10
300 GRAPHICS 1+16
301 POKE (PEEK(560)+256*PEEK(561))+3,64+
7:SETCOLOR 2,7,10
302 ? #6;"      you both lost!!!"
303 ? #6:?" #6:?" #6;"      unlucky!!!!"
304 FOR W=0 TO 10:SOUND 0,
S*10,10,4:SOUND 0,0,0,0:NEXT W:NEXT S
310 GOTO 190
500 GRAPHICS 1+16
501 POKE (PEEK(560)+256*PEEK(561))+3,64+

```



```

7:SETCOLOR 2,7,10
502 ? #6;" PLAYER NO.2 WINS"
503 FOR ZZZ=0 TO 100:FOR W=0 TO 20:NEXT
W:SOUND 0,ZZZ,10,4:NEXT ZZZ
504 SOUND 0,0,0,0
510 GOTO 610
600 GRAPHICS 1+16
601 POKE (PEEK(560)+256*PEEK(561))+3,64+
7:SETCOLOR 2,7,10
602 ? #6;" PLAYER NO.1 WINS"
603 FOR ZZZ=0 TO 100:FOR W=0 TO 20:NEXT
W:SOUND 0,ZZZ,10,4:NEXT ZZZ
604 SOUND 0,0,0,0
610 ? #6: ? #6: ? #6: ? #6
620 ? #6;" hit any key for"
630 ? #6;" another game"
640 GET #1,K:RUN
1000 FOR W=0 TO 500:NEXT W

```

```

1001 RETURN
2000 OPEN #1,4,0,"K"
2001 GRAPHICS 1+16
2002 POKE (PEEK(560)+256*PEEK(561))+3,64
+7
2003 ? #6;" snakes"
2004 SETCOLOR 2,0,14
2010 ? #6: ? #6: ? #6
2020 ? #6;" IN THIS 2 PLAYER"
2021 ? #6;" GAME EACH PLAYER"
2022 ? #6;" TRIES TO AVOID THE"
2023 ? #6;" OTHERS TRAIL"
2024 ? #6;" USING THE JOYSTICK"
2025 ? #6: ? #6: ? #6;"hit any key to begi
n"
2026 GET #1,K
2030 RETURN
9999 GOTO 9999

```

RED ALERT

BY SIMON PARKER

RUNS ON A VIC-20

IN 16K

Got tunnel vision? Then this game is the one for you! Zapping through narrow tunnels is a task some arcade video freaks just love. And here's a program that will save a few of those precious 10p's.

It's based on arcade Scramble — the game that you either love or hate. For those of you who have yet to come across the game — and you must be few and far between here's a rundown on what you have to do. The idea is to pilot a spacecraft over the ever changing landscape of an alien cavern, dotted with fuel dumps. You must avoid the walls of the cavern and the spaceships which advance against you. You bomb the fuel dumps and shot down the ships — it's as simple as that!

The program is written mainly in basic apart from a small machine code routine in subroutine 5000. This is used to pull the screen from right to left. The game can be controlled using either the keyboard or a joystick.

```

0 REM**RED ALERT**
1 REM**BY SIMON PARKER**
2 REM**27/6/1982
5 P=7904
6 J=5:G=5:CC=.5:DD=.9
7 GOSUB1000:GOSUB5000
8 TI$="000000"
10 PRINT"RED"
20 POKE36879,143:POKE36878,15
30 B=RND(1)
31 IFTI$="000200"THENPOKE36879,8:CC=.65:DD=.8
32 IFTI$="000330"THENPOKE36879,57:CC=.75:DD=.7
35 C=RND(1)
36 IFB<CCTHENJ=J+1:GOTO40
37 J=J-1
40 IFC<CCTHENG=G+1:GOTO46
45 G=G-1
46 IFJ>10ANDG>10THENG=G-1:J=J-1
47 IFJ+G>17THENJ=J-1:G=G-1
48 IFJ<1THENJ=1
49 IFG<1THENG=1
50 FORK=1TOJ
60 POKE8185-22*K,20
61 NEXTK:IFB<20RB>.8THENPOKE8185-22*K,22:POKE81
85+30720-22*K,2
62 FORK=1TOG
65 POKE7701+22*K,20
66 NEXTK
70 IFC>DDTHENPOKE7701+22*K+44,24:POKE38421+22*K+44,2
91 POKEP,32
100 SYS(829)
125 POKEP,21:POKEP-1,32
126 PRINT"SCORE"SC
130 POKEP,32
135 L2=PEEK(197):P2=PEEK(653)
140 L=PEEK(37137):POKE37154,127:P1=PEEK(37152):POKE37154,255
143 IFL=30ANDP1=1190RP2=1ANDL2=14THENGOSUB4000:GOTO181
145 IFL=300RP2=1THENS=SC-50:GOSUB3000:GOTO181
150 IFL=540RL2=22THENP=P+22
160 IFL=460RL2=13THENP=P-1
170 IFL=580RL2=53THENP=P-22
180 IFP1=1190RL2=14THENP=P+1
181 IFPEEK(P+1)<>32THENGOTO2000
190 POKEP,21:POKEP-1,32:POKE36877,120+INT((P-7680)/4)
200 GOTO30
1000 POKE52,28:POKE56,28

```



```

1010 FORI=7168T07679:POKEI,PEEK(I+25600):NEXT
1030 FORC=7328T07367:READA:POKEC,A:NEXT
1035 POKE36869,255:RETURN
1040 DATA170,85,170,85,170,85,170,85
1050 DATA0,128,192,224,254,255,255,0
1060 DATA60,60,126,126,255,60,66,129
1070 DATA160,80,168,75,168,80,160,0
1080 DATA0,1,3,7,127,255,255,0
2000 FORI=1T010
2010 POKE36879,I*10
2011 POKE36878,10-I
2012 POKE36877,220
2020 FORK=1T0200:NEXTK
2030 NEXTI
2040 FORL=1T01000:NEXTL
2045 POKE36869,240:PRINT"J"
2050 PRINT"ANOTHER GAME OVER"
2060 PRINT"YOU SCORED"SC
2070 PRINT"ANOTHER GAME (Y/N)"
2080 GETA$:IFA$=""THEN2080
2081 IFA$="Y"THENJ=8:G=8:P=7904:SC=0:TI$="000000":POKE36869,255:GOTO10
2082 IFA$="N"THENPRINT"J":POKE36869,240:END
2090 GOTO2080
3000 FORM=1T010
3005 POKEN,32
3010 N=P+M*22:POKE36876,150+M*10
3020 IFPEEK(N)=22THENSC=SC+250:POKEN,42:POKE36876,0:RETURN
3030 IFPEEK(N)=20THENPOKEN,42:POKE36876,0:RETURN
3040 POKEN,90:NEXTM:POKEN,32:POKE36876,0:RETURN
4000 SC=SC-100:FORB=1T010:POKEM1,32:M1=P+B:POKE36876,240:POKE36876,0
4010 IFPEEK(M1)=20THENPOKEM1,20:RETURN
4011 IFPEEK(M1)=22THENSC=SC+200:POKEM1,32:RETURN
4012 IFPEEK(M1)=24THENSC=SC+150:POKEM1,32:RETURN
4020 POKEM1,42:POKEM1+30720,1
4030 NEXTB:POKEM1,32:RETURN
5000 FORK=829T0874:READS:POKEK,S:NEXTK:RETURN
5010 DATA169,19,32,210,255,169,29,32,210,255,169,13,32,210,255,169,0,141,60,3
5020 DATA169,29,32,210,255,169,20,32,210,255,169,13,32,210,255,238,60,3,173,60,3
5030 DATA201,21,208,231,96
5040 RETURN

```

BY M. LEVIN

RUNS ON AN

ATOM IN 16K

Warning. This game can impair your sanity.

Written in machine code for an Atom with at least 3K of RAM this program seems designed to either increase your reasoning power or destroy what little sanity you may have left.

You are given a nine square grid with a random number of these squares illuminated. By pressing any of the numeric keys within the range of 1-9, different combination of these squares may be obtained.

The final object being to light up all the squares except the centre one. Should you manage this task you are rewarded by a dizzying display of sight and sound, small consolation for shattered nerves.

```

10DIMKK0,WW2
20P.#12"WAIT"#21
30GOS.a:GOS.a:GOS.a
40!#300=#BF00BFBF;!#304=#000000BF;?#308=#00
50!#310=#00BFBFBF;!#314=#00000000;?#318=#00
60!#320=#00BFBFBF;!#324=#0000BFBF;?#328=#00
70!#330=#BF0000BF;!#334=#00BF0000;?#338=#00
80!#340=#BF00BF00;!#344=#BF00BFBF;?#348=#00
90!#350=#00BF0000;!#354=#0000BF00;?#358=#BF
100!#360=#BF000000;!#364=#BFBF00BF;?#368=#00
110!#370=#00000000;!#374=#BFBF0000;?#378=#BF
120!#380=#00000000;!#384=#BF00BFBF;?#388=#BF;CLEAR0
130IFR.%2=0;?#80A7=FFF;IFR.%2=0;?#80AB=FFF;IFR.%2=0;?#80AF=FFF
140IFR.%2=0;?#8107=FFF;IFR.%2=0;?#810B=FFF;IFR.%2=0;?#810F=FFF
150IFR.%2=0;?#8167=FFF;IFR.%2=0;?#816B=FFF;IFR.%2=0;?#816F=FFF
160!#DE=#0025:P."magic"$128"square"
170MOVE10,9;DRAW10,35;MOVE27,9;DRAW27,35;MOVE10,18;DRAW35,18
180MOVE10,26;DRAW35,26

```

MAGIC SQUARE

```

190 LINK #3300
195 RUN
200 END
210a P=#3300
220C:KK0 J8R#FFE3 \ GET KEY
230 CMPQ#31;BMI KK0
240 CMPQ#40;BPL KK0
250 ANDQ#0F

```



```

260 ROL A:ROL A      870 CMPQ#FF
270 ROL A:ROL A      880 BNE KK1
280 STA#80           890 LDA#810B
290 SEC:SBCQ#10      900 CMPQ#40
300 TAX              910 BNE KK1
310 LDYQ9            920 LDA#810F
320 LDA#80A7         930 CMPQ#FF
\ COMPLIMENT         940 BNE KK1
330 EOR#300,X        950 LDA#8167
340 STA#80A7         960 CMPQ#FF
350 INX              970 BNE KK1
360 LDA#80AB         980 LDA#816B
370 EOR#300,X        990 CMPQ#FF
380 STA#80AB         1000 BNE KK1
390 INX              1010 LDA#816F
400 LDA#80AF         1020 CMPQ#FF
410 EOR#300,X        1030 BNE KK1
420 STA#80AF         1050 LDAQ8:STA#40
430 INX              ;BCSKK5
440 LDA#8107         1051:WW0 LDXQ#90
450 EOR#300,X        \BLEEP
460 STA#8107         1052:WW1 TXA:TAY
470 INX              1053 LDA#B002
480 LDA#810B         1054 EORQ4
490 EOR#300,X        1055 STA#B002
500 STA#810B         1056:WW2 DEY:BNE WW2
510 INX              1057 DEX:BNE WW1
520 LDA#810F         1058 RTS
530 EOR#300,X        1060:KK5 LDA#80A7
540 STA#810F         \ DISPLAY WIN
550 INX              1070 EORQ#BF
560 LDA#8167         1080 STA#80A7
570 EOR#300,X        1090 JSR WW0
580 STA#8167         1100 LDA#80AB
590 INX              1110 EORQ#BF
600 LDA#816B         1120 STA#80AB
610 EOR#300,X        1130 JSR WW0
620 STA#816B         1140 LDA#80AF
630 INX              1150 EORQ#BF
640 LDA#816F         1160 STA#80AF
650 EOR#300,X        1170 JSR WW0
660 STA#816F         1180 LDA#810F
670 BCS KK2          1190 EORQ#BF
680:KK1 JMP KK0      1200 STA#810F
690:KK2 LDYQ#AA      1210 JSR WW0
\ BLEEP             1220 LDA#816F
700 LDA#B002         1230 EORQ#BF
710:KK3 LDX#80       1240 STA#816F
720:KK4 DEX:BNE KK4  1250 JSR WW0
730 EORQ4            1260 LDA#816B
740 STA#B002         1270 EORQ#BF
750 DEY              1280 STA#816B
760 BNE KK3          1290 JSR WW0
770 LDA#80A7         1300 LDA#8167
\ WIN CHECK         1310 EORQ#BF
780 CMPQ#FF          1320 STA#8167
790 BNE KK1          1330 JSR WW0
800 LDA#80AB         1340 LDA#8107
810 CMPQ#FF          1350 EORQ#BF
820 BNE KK1          1360 STA#8107
830 LDA#80AF         1370 JSR WW0
840 CMPQ#FF          1380 DEC#40:BNE KK5
850 BNE KK1          1390 RTS
860 LDA#8107         1400]
                    1490 RETURN

```

BREAK⁰UT!

Ever feel like you're just banging your head up against a brick wall? Well, here's your chance. Simply program in this little number and you'll be able to knock down walls as quick as your computer can build them. '8' moves it right.

BY DAVID HOUNSLOW

RUNS ON A SPECTRUM IN 16K

```

1 LET hs=0: LET ss="0000"
5 LET ss=0: PAPER 0: BORDER 0
INK 7: FLASH 0: BRIGHT 0: CLS
PRINT AT 10,2: FLASH 1: "Do you
want instructions?"
6 LET a$=INKEY$: IF a$="" THEN
N GO TO 6
8 IF a$="Y" OR a$="y" THEN GO
SUB 600
10 LET s=0: LET ballleft=1: L
ET b=5: FOR x=0 TO 7: READ row:
POKE USR "P"+x,row: NEXT x
15 LET b$=CHR$ 16+CHR$ 4+"—"
20 DATA BIN 00111100,BIN 01111
110,255,255,255,255,BIN 0111110
BIN 00111100
30 RESTORE
40 PAPER 0: INK 6: LET xmove=1
LET ymove=-1
50 BORDER 0
52 REM page 1

54 IF ss>=280 THEN CLS: LET b
allleft=ballleft-1: LET ss=0:
PRINT AT 10,10: FLASH 1: INK 6: "
EXTRA BALL": BEEP .25,20: FOR p=
1 TO 100: NEXT p: IF ballleft=0
THEN LET ballleft=1
55 CLS
56 LET bn=0: IF hs<s THEN LET
hs=s
57 PRINT AT 2,0: PAPER 2: " " P
RINT AT 1,2: PAPER 0: INK 7: "SCO
RE: " INK 7: s$( TO 4-LEN (STR$ (
s)))s: INK 7: AT 1,14: "HIGH: "s$
( TO 4-LEN (STR$ (hs)))hs: INK
7: AT 1,31-7: "BALL: " INK 6: balls
left
60 PRINT AT 3,0:
70 FOR y=4 TO 8: FOR x=2 TO 29
STEP 2: PRINT AT y,x: PAPER b+(
y/2=INT (y/2)): " ": LET b=b+1:
IF b=7 THEN LET b=5
80 NEXT x: NEXT y
88 FOR y=0 TO 21: PRINT AT y,0
PAPER 2: " " AT y,30: " " NEX
T y: PRINT AT 21,0: PAPER 2: " " A
T 0,0: " "
89 PRINT AT 18,0: " " AT 18,30
" " AT 17,0: " " AT 17,30: " "
90 LET x=15
91 BEEP .5,10: FOR q=1 TO 2: B
EEP .125,11: BEEP .125,12: BEEP
.125,13: BEEP .5,10: NEXT q
95 LET bx=20: LET bx=INT (RND*
20)+5: IF bx/2=INT (bx/2) THEN G
O TO 95
100 PRINT AT 18,x: b$
110 GO SUB 300
115 IF INKEY$="" THEN GO TO 100
117 PRINT AT 18,x: "
120 LET x=x+2*(INKEY$="8")-2*(I

```



```

NKEY$="5"): IF X<0 THEN LET X=0
121 IF X>29 THEN LET X=29
130 GO TO 100
300 PRINT AT BY,BX;" "
310 LET BY=BY+YMOVE: LET BX=BX+
XMOVE
315 IF BY<=3 THEN LET YMOVE=1:
BEEP .01,25
320 IF BX>28 OR BX<3 THEN LET X
MOVE=-XMOVE: BEEP .01,25
325 IF BY>=20 THEN LET BALLSLEFT
t=ballsleft+1: BEEP .2,-30: BEEP
.5,-35: IF NOT ballsleft=4 THEN
PRINT AT 1,29,BALLSLEFT: LET YM
ove=-1: LET XMOVE=1: GO TO 95
326 IF ballsleft=4 THEN GO TO 5
00
330 LET ATTR=ATTR (BY,BX)
335 IF ATTR=6 THEN GO TO 410
336 IF ATTR=4 AND YMOVE=-1 THEN
GO TO 410
340 IF (X<=BX<=X+3 OR ATTR=4) A
ND BY=18 AND YMOVE=1 THEN LET YM
ove=-1: BEEP .01,30: GO TO 310
350 IF ATTR=46 OR ATTR=54 OR AT
tr=56 THEN LET YMOVE=1: PRINT AT
BY,BX;" " IF BX+1<=29 THEN IF
ATTR (BY,BX+1)=ATTR THEN PRINT A
T BY,BX+1;" " GO TO 370
360 IF BX+1>=3 THEN IF ATTR (BY
,BX-1)=ATTR THEN PRINT AT BY,BX-
1;" "
370 LET BN=BN+1: LET SS=SS+1: L
ET S=S+5: PRINT AT 1,8:S$( TO 4-
LEN (STR$ (S))) : S: BEEP .01,35:
IF BN=70 THEN GO TO 40

```

```

375 IF S>=9995 THEN LET S=0
380 IF S>HS THEN LET HS=S: PRIN
T AT 1,19:S$( TO 4-LEN (STR$ (HS
))) : HS
381 GO TO 400
410 PRINT AT BY,BX: INK 6;"●"
420 RETURN
500 PRINT AT 10,12: FLASH 1: IN
K 6:"GAMEOVER": FOR X=1 TO 500:
NEXT X: CLS : IF S>HS THEN LET H
S=S
501 GO TO 5
600 PAPER 7: INK 0: CLS
610 PRINT "This is a game f
or 1 player. The object is to kn
ock as many bricks out of the m
ulticoloured wall as you can: Yo
u do this by stopping the ball f
rom going off the bottom of the s
creen by hitting it with you
r bat. You have 3 balls in whi
ch to score as many points as y
ou can." INK 5: MOVES YOUR
BAT LEFT..... INK 2: TAB 4: BR
BAT RIGHT..... INK 2: TAB 4: BR
IGHT 1: "PRESS ANY KEY TO START"
630 PAUSE 0: LET A$=INKEY$: IF
A$="" THEN GO TO 630
640 RETURN

```

AIR ATTACK

BY IAN STRINGER

RUNS ON AN ATARI 400 IN 16K

You are in command of a giant battleship armed with all the latest weapons. And you are under attack.

Jet fighters, helicopters and armoured balloons are out to do your ship damage.

Your task is to use your supply of missiles - 20 in all - to the best advantage. Shoot down as many of the enemy as possible with the limited supply of weaponry. When your armament is used up the computer shows the high score.

```

1 REM . *** AIR ATTACK ***
2 REM . By Ian Stringer
3 REM . 1982
4 REM
5 DIM Y(4):Y(0)=91:Y(1)=20:Y(2)=30:Y(3)=
40:Y(4)=88:REM Controls vertical positio
n of 4 players
6 X1=100:X2=150:X3=55:X0=100:Q1=-3:Q2=4:
Q3=-2:Q0=2:REM X controls horz. position
of players. Q controls speed
7 B=75:B1=B:XA=60
10 PMBASE=54279:RAMTOP=106:SDMCTL=559:GR
ACTL=53277:HPOSP0=53248:HPOSP1=53249:HPO
SP2=53250:HPOSP3=53251
20 PCOLR0=704:PCOLR1=705:PCOLR2=706:PCOL
R3=707
30 SIZEP0=53256:SIZEP2=53258:REM Used to
alter width of players 0 & 2
50 P1PF=53253:P2PF=53254:P3PF=53255:REM
Used to detect collisions between playfi
eld(missile) & players
90 POKE SIZEP0,1:POKE SIZEP2,1:REM Playe
rs 0 & 2 set to double width
99 REM
100 GRAPHICS 7
110 A=PEEK(RAMTOP)-24:POKE PMBASE,A:MYPM
BASE=256*A:POKE SDMCTL,46:POKE GRCTL,3
120 POKE HPOSP0,X0:POKE HPOSP1,X1:POKE H
POSP2,X2:POKE HPOSP3,X3
125 REM
130 FOR I=MYPMBASE+384 TO MYPMBASE+1024:
POKE I,0:NEXT I:REM Clears P-M RAM

```

```

140 FOR I=MYPMBASE+512+Y(0) TO MYPMBASE+
516+Y(0):READ A:POKE I,A:NEXT I
150 FOR I=MYPMBASE+640+Y(1) TO MYPMBASE+
644+Y(1):READ A:POKE I,A:NEXT I
160 FOR I=MYPMBASE+768+Y(2) TO MYPMBASE+
773+Y(2):READ A:POKE I,A:NEXT I
170 FOR I=MYPMBASE+896+Y(3) TO MYPMBASE+
905+Y(3):READ A:POKE I,A:NEXT I
180 REM Lines 140-170 read player data i
nto P-M RAM
190 POKE PCOLR0,88:POKE PCOLR1,26:POKE P
COLR2,138:POKE PCOLR3,186
191 POKE 752,1:SH=20:REM 752,1 removes c
ursor
192 GOSUB 1600
196 GOSUB 1500
199 REM
200 GOSUB 1000:REM MOVE TARGET
210 IF STRIG(0)=0 THEN ST=1
220 IF ST=1 THEN GOSUB 1200:REM BULLET
230 GOSUB 1100:REM MOVE SHIP
240 GOSUB 1300:REM CHECK HITS
250 IF SH=0 THEN GOSUB 1410
300 GOTO 200
1000 X1=X1+Q1:POKE HPOSP1,X1:IF X1<35 TH
EN X1=220
1010 X2=X2+Q2:POKE HPOSP2,X2:IF X2>220 T
HEN X2=35
1020 X3=X3+Q3:POKE HPOSP3,X3:IF X3>215 O
R X3<35 THEN Q3=-Q3
1090 RETURN
1100 F=230:IF STICK(0)=11 THEN X0=X0-Q0:

```


F=170

```

1110 IF STICK(0)=7 THEN X0=X0+Q0:F=180
1115 IF X0>199 THEN X0=199
1116 IF X0<40 THEN X0=40
1120 POKE HPOSP0,X0:SOUND 3,F,6,10
1130 RETURN
1200 COLOR 0:PLOT XA,B
1210 B=B-2:COLOR 1:PLOT X0-40,B:XA=X0-40
1220 SOUND 0,B,10,14
1250 IF B<2 THEN COLOR 0:PLOT XA,B:B=75:
ST=0:SH=SH-1
1290 RETURN
1300 IF PEEK(P1PF)<>0 THEN HIT=1:GOTO 13
40
1310 IF PEEK(P2PF)<>0 THEN HIT=2:GOTO 13
40
1320 IF PEEK(P3PF)<>0 THEN HIT=3:GOTO 13
40
1340 IF HIT=0 THEN 1390
1345 FOR S=20 TO -20 STEP -1:SOUND 0,ABS
(S),8,12:NEXT S
1350 IF HIT=1 THEN SC=SC+30:X1=30
1355 IF HIT=2 THEN SC=SC+15:X2=225
1360 IF HIT=3 THEN SC=SC+5:X3=43:Q=1
1385 COLOR 0:PLOT XA,B
1389 SOUND 0,0,0,0:ST=0:B=75:HIT=0:POKE
53278,1:SH=SH-1
1390 POKE 656,1:POKE 657,9:? SC
1395 POKE 656,1:POKE 657,30:? SH;" "
1400 RETURN
1410 OPEN #1,4,0,"K:":SOUND 3,0,0,0
1415 ? "}"
1420 POKE 656,1:POKE 657,2:? " YOU SCOR
ED ";SC;" IN 20 SHOTS.

```

```

AY AGAIN (Y/N)";:GET #1,K
1425 IF K=255 THEN 1420
1430 IF K<>89 THEN END
1435 IF SC>HSC THEN HSC=SC
1440 SC=0:SH=20
1480 ? "}"
1486 GOSUB 1500
1488 POKE 656,2:POKE 657,14:? HSC
1489 CLOSE #1
1490 RETURN
1500 POKE 656,1:POKE 657,3:? "SCORE"
1510 POKE 656,1:POKE 657,24:? "SHOTS"
1520 POKE 656,2:POKE 657,3:? "HIGH SCORE
"
1550 RETURN
1600 XX=0:POKE 656,0:POKE 657,10:? "***
AIR ATTACK ***":SOUND 0,255,10,8:SOUND 1
,254,10,8
1619 XX=XX+1:IF XX>10 THEN 1630
1620 POKE 656,2:POKE 657,13:? "Press STA
RT"
1630 IF PEEK(53279)=6 THEN 1690
1640 GOSUB 1000
1649 IF XX<10 THEN 1680
1650 POKE 656,2:POKE 657,19:? " "
1651 IF XX>20 THEN XX=0
1680 GOTO 1619
1690 SOUND 0,0,0,0:SOUND 1,0,0,0:? "}:R
ETURN
2999 REM
3000 DATA 8,8,30,63,255,253,51,94,120,12
0,128,192,254,255,12,56,60,126,255,255,2
55,189,66,36,60,60

```

WORLD CUP

BY G. R. JOHNSON

RUNS ON A BBC MODEL B IN 32K

Remember the World Cup? Those heady summer days when England still had it all to play for and everyone was saying that this time the lads could pull it off . . .

Well they didn't quite make it did they? And now there's another four years to wait until the next one. Still, you can fill in the time by programming in our version of the World Cup conflict.

By special request we're reprinting one of C&VG's most popular program listings — first published in June last year. But this time we've adapted it so all you BBC owners out there can become soccer supremos.

World Cup Manager sets out to give you all the frustrations of sitting on the bench when the national side you manage go a goal down 20 minutes from time in a crucial match.

Hopefully, with some careful attention to tactics and good substitutions in critical games, it should give you all the elation of guiding your coun-

try's team through to the championships of the World Cup Finals.

It will let you manage any of the 24 countries involved in the 1982 World Cup but expect to have a more difficult time if you pick El Salvador than if you choose Brazil.

It invites you to enter your team and then publishes the draw for the competition with initially six groups of four. Set out the countries you think will be stumbling blocks to your continuation in the competition and send off your scouts to watch them.

Remember you can get through by finishing second in your group so it may not be necessary to watch all three teams in your group. The first game comes up and a dossier on the opposition is printed out. Pay careful attention because you will have to find good tactical answers to the opposition's ploys.

There are other considerations too, choose your formation carefully and if you need to boost your goal differ-

ence to quality, try to manufacture an open game.

Then it's out of your hands and the two teams are up against one another with a running commentary of events. Keep a close check on which of your players seem to lose possession and play badly, these are the one's you will want to substitute.

Also watch for which team is gaining the most possession in midfield — you may need to change tactics.

Check on how the goals are scored — it could be important to tighten up your defence to certain situations or to find out which of your own attacking ploys is paying dividends.

Half-time comes around and this is your chance to change your tactics if you have noticed things going wrong.

At the end of the day, win, lose or draw, you will have to sit back and watch the other results of the day being typed out and see if your predictions are coming true.


```

10 *TV 255,1
20 MODE 7
30 DIM K$(12)
40 J$=STRING$(150,"?"):J$=""
50 E1=0:E2=0:X3=0:X5=0
60 DIM Q(4),W(4),D9(4),F9(4),A9(4),H$(4,3),D8(4),T9(4),P9(4),R$(24),S8(4),N1
(2),G$(24),O$(6,4),A$(3,3),B$(3,3),C$(3,3),D$(3,3),T4$(20),A$(24),F$(24),I$(3,3),
J$(3,3),M$(24,21),N$(24),T$(24),U$(24),V$(24),W$(24),X$(24),Y$(24)
70 DIM Z$(24),Z9$(12),A1$(9),A2$(9),E$(11):V=0:B4=0
80 DEF FNA(X)=INT(RND(1)*X)+1
90 DATA BRAZIL,ARGENTINA,W.GERMANY,YUGOSLAVIA,HUNGARY,BELGIUM,ITALY,POLAND,F
RANCE,CZECHOSLOVAKIA,SPAIN,ENGLAND,SCOTLAND,N.IRELAND,PERU,AUSTRIA,CHILE,EL SALV
ADOR,HONDURAS,ALGERIA,N.ZEALAND,CAMEROON,KUWAIT,RUSSIA
100 DATA 1,1,0,1,2,1,1,0,0,0,0,1,1,2,1,0,2,2
110 DATA " HITS THE BALL TOO FAR AHEAD OF ","'S PASS IS MISCONTROLLED BY ","
LOSES THE BALL IN A MISUNDERSTANDING WITH "," HITS A LONG BALL TO "," PASSES WID
E TO "," CROSSES TO "," PLAYS A HIGH BALL TO "," COLLECTS A PASS FROM "
120 DATA " PLAYS A ONE-TWO WITH "," IS SENT AWAY BY "," WINS A FREE KICK FROM
"," MOVES INSIDE "," SWERVES PAST "," DUMMIES "," RUNS ROUND "," RACES PAST ","
SHRUGS OFF A CHALLENGE FROM "," IS TACKLED BY ","'S PASS IS CUT OUT BY "
130 DATA "'S CROSS IS HEADED AWAY BY ",5,15,30,30,5,15,15,30,5,5,30,15,15,5,3
0,30,15,5,5,30,15,15,5,30,30,15,5,"'S CHIP FOR GOAL IS HEADED AWAY BY"," LOSES T
HE BALL TO"," IS TACKLED BY","'S VOLLEY IS PUNCHED CLEAR BY"
140 DATA "'S FIERCE DRIVE IS WELL SAVED BY"," BLASTS THE BALL WIDE "," ROUNDS
THE KEEPER AND MISKICKS "," BEATS TWO DEFENDERS AND SHOOTS WIDE "," STUMBLES AN
D LOSES THE BALL ","'S CHIP FOR GOAL FINDS THE BACK OF THE NET"
150 DATA " BLASTS THE BALL HOME"," VOLLEYS INTO THE ROOF OF THE NET"," TAPS T
HE BALL IN FROM 5 YARDS"," HITS A LOW SHOT INTO THE NET","'S SHOT BOUNCES UNDER
THE KEEPER","'S SOFT SHOT IS DROPPED BY THE KEEPER"," LETS FLY WITH A LONG SHOT"
160 DATA " STEPS INSIDE THE FULLBACK, ROUNDS THE KEEPER AND SLOTS HOME"
170 PROC SORT:CLS:PRINT"CHOOSE YOUR TEAM-ENTER A NO. FROM LIST"
180 X=1:PROC CHOOSE:PROCTEAM
190 CLS:PRINT"NOW KEY IN THE NAMES OF YOUR PLAYERS":PRINT CHR$(136);"--MAXIMU
M OF 15 LETTERS--"

```

```

200 FOR I=1 TO 12
210 IF I=1 THEN PRINT"GOALKEEPER "
220 IF I>1 AND I<6 THEN PRINT"DEFENDER "+STR$(I-1)
230 IF I>5 AND I<9 THEN PRINT"MIDFIELD "+STR$(I-5)
240 IF I>8 AND I<12 THEN PRINT"STRIKER "+STR$(I-8)
250 IF I=12 THEN PRINT"SUBSTITUTE "
260 INPUT K$(I)
270 IF LEN(K$(I))>15 THEN PRINT"NAME IS TOO LONG.RE-ENTER.":GOTO 260
280 NEXT I
290 CLS:PRINT "YOU ARE MANAGER OF ";CHR$(136);A$(T)
300 PRINT "YOUR AIM IS TO WIN THE 1982 WORLD CUP"
310 PROC WAIT
320 FOR I=1 TO 6
330 S=0
340 Y=FNA(24)
350 IF G$(Y)(<>) THEN GOTO 340
360 S=S+1
370 G$(Y)=I:O$(I,S)=Y
380 IF S=4 THEN GOTO 400
390 GOTO 340
400 NEXT I
410 CLS:PRINT"THE DRAW IS:--"
420 FOR I=1 TO 3
430 PRINT:PRINT "GP. "STR$(I);TAB(20);"GP. ";STR$(I+3):PRINT
440 FOR J=1 TO 4
450 PRINTA$(O$(I,J));TAB(20);A$(O$(I+3,J))
460 NEXT J:NEXT I
470 PRINT

```

```

480 PROC CONTINUE:PROC SCOUT:PROC FIXTURE:PROC SECSTAGE:PROC CONTINUE:PROC SEC FIXT:
PROC SEMI:PROC SEMIPLAY:PROC FINAL
490 PROC CONTINUE
500 IF E2>E1 THEN B2=X2:B3=X1
510 IF E1>E2 THEN B2=X1:B3=X2
520 CLS:PRINTTAB(0,6)"CONGRATULATIONS TO:--":PRINTTAB(10,10);CHR$(136);A$(B2)

```



```

530 PRINTTAB(0,15);"1982 WORLD CUP WINNERS"
540 PRINTTAB(0,21)"DO YOU WISH TO PLAY AGAIN?"
550 INPUT "TYPE 'Y' OR 'N' " S$
560 IF ASC(S$)=89 THEN CLS:RUN
570 IF ASC(S$)=78 THEN CLS
580 IF ASC(S$)(>89 AND ASC(S$)(<78 THEN GOTO 550

```

```

590 END
600 DEFPROC SORT
610 FOR I=1 TO 24
620 F%(I)=INT(RND(1)*3)+1
630 READ A$(I)
640 X%(I)=FNA(3)
650 Y%(I)=FNA(3)
660 Z%(I)=FNA(3)
670 T%(I)=FNA(3)
680 U%(I)=FNA(3)
690 V%(I)=FNA(3)
700 W%(I)=FNA(3)
710 NEXT I
720 FOR I=1 TO 3
730 FOR J=1 TO 3
740 D%(I,J)=10
750 READ I%(I,J):READ J%(I,J)
760 NEXT J:NEXT I
770 FOR I=1 TO 20
780 READ T4$(I)
790 NEXT I
800 FOR I=1 TO 3
810 FOR J=1 TO 3
820 READ A%(I,J)
830 READ B%(I,J)
840 READ C%(I,J)
850 NEXT J:NEXT I
860 FOR I=1 TO 3
870 R%(I)=INT(RND(1)*10)+21
880 NEXT I
890 FOR I=4 TO 11
900 R%(I)=INT(RND(1)*10)+16
910 NEXT I
920 FOR I=12 TO 14

```

```

930 R%(I)=20
940 NEXT I
950 FOR I=15 TO 17
960 R%(I)=INT(RND(1)*5)+16
970 NEXT I
980 FOR I=18 TO 23
990 R%(I)=INT(RND(1)*5)+11
1000 NEXT I
1010 R%(24)=INT(RND(1)*22)+11
1020 D%(1,1)=5
1030 D%(3,3)=15
1040 FOR I=1 TO 12
1050 Z9$(I)=" NO. "+STR$(I)
1060 NEXT I
1070 Z9$(1)="THEIR GOALKEEPER "
1080 FOR I=1 TO 9
1090 READ A1$(I)
1100 NEXT I
1110 FOR I=1 TO 9
1120 READ A2$(I)
1130 NEXT I
1140 ENDPROC
1150 DEF PROC CHOOSE
1160 FOR I=1 TO 12
1170 IF X=1 THEN GOTO 1240
1180 IF (T-I)*(T-12-I)(>0 THEN GOTO 1240
1190 IF T=I+12 THEN GOTO 1220
1200 PRINTTAB(20);STR$(I+12);". ";A$(I+12)
1210 GOTO 1250
1220 PRINTSTR$(I);". ";A$(I)
1230 GOTO 1250
1240 PRINT STR$(I);". ";A$(I);TAB(20);STR$

```

```

(I+12);". ";A$(I+12)
1250 NEXT I
1260 PRINT:PRINT
1270 ENDPROC
1280 DEF PROC TEAM
1290 INPUT "WHICH TEAM?" T$
1300 T=VAL(T$)
1310 IF T(1 THEN GOTO 1340
1320 IF T>24 THEN GOTO 1340
1330 GOTO 1360
1340 PRINT "ENTER A NO. BETWEEN 1 & 24"
1350 GOTO 1290
1360 ENDPROC
1370 DEF PROC WAIT
1380 TIME=0:REPEAT:UNTIL TIME=400
1390 ENDPROC
1400 DEF PROC CONTINUE
1410 PRINT "PRESS ANY KEY TO CONTINUE"
1420 Z$=GET$
1430 IF Z$="" THEN 1420
1440 ENDPROC
1450 DEF PROC SCOUT
1460 CLS
1470 PRINT "SCOUTS CAN COMPILE DOSSIERS ON 4 TEAMS"
1480 PRINT "ENTER 4 NOS. FROM THE FOLLOWING:"
1490 PRINT "SEPARATED BY COMMAS":PRINT "===== == =====":PRINT
1500 X=2
1510 PROC CHOOSE
1520 INPUT S1,S2,S3,S4
1530 IF (S1-T)*(S2-T)*(S3-T)*(S4-T)=0 THEN GOTO 1570
1540 IF (S1-S2)*(S1-S3)*(S1-S4)*(S2-S3)*(S2-S4)*(S3-S4)=0 THEN 1570
1550 IF S1<1 OR S1>24 OR S2<1 OR S2>24 OR S3<1 OR S3>24 OR S4<1 OR S4>24 THEN

```




```

1930 IF W6=4 THEN PROCX
1940 IF W6=4 THEN GOTO 1960
1950 K1=1:K2=3:J1=4
1960 FOR I=1TOW6
1970 PROCPOS
1980 PROCPOSPRINT
1990 NEXT I
2000 ENDPROC
2010 DEF PROCPOS
2020 FOR J=1TOJ1
2030 Q(J)=0:F9(J)=0:A9(J)=0:P9(J)=0:W(J)=0:DB
(J)=0:D9(J)=0
2040 NEXT J
2050 FOR J=1TOJ1
2060 T9(J)=0*(I,J)
2070 FOR K = K1 TO K2
2080 IF M%(T9(J),K)=0 THEN GOTO 2190
2090 F9(J)=M%(T9(J),K+7)+F9(J)
2100 A9(J)=M%(T9(J),K+14)+A9(J)
2110 Z7=M%(T9(J),K+7)
2120 Z6=M%(T9(J),K+14)
2130 DB(J)=Z7-Z6+DB(J)
2140 Q(J)=Q(J)+1
2150 IF Z7=Z6 THEN D9(J)=D9(J)+1
2160 IF Z6<Z7 THEN W(J)=W(J)+1
2170 IF Z6<Z7 THEN P9(J)=P9(J)+2
2180 IF Z6=Z7 THEN P9(J)=P9(J)+1
2190 NEXT K
2200 NEXT J
2210 F2=0
2220 FOR J=1TOJ1-1
2230 IF P9(J)<P9(J+1) THEN PROC_SWAP
2240 IF P9(J)=P9(J+1) THEN PROC_GOALDIFF
2250 NEXT J
2260 IF F2=1 THEN GOTO 2210
2270 ENDPROC
2280 DEF PROC_GOALDIFF
2290 IF DB(J)<DB(J+1) THEN PROC_SWAP
2300 IF DB(J)=DB(J+1) THEN ENDPROC
2310 IF F9(J)<F9(J+1) THEN PROC_SWAP
2320 IF F9(J)=F9(J+1) THEN ENDPROC
2330 IF FNA(2)=1 THEN PROC_SWAP
2340 ENDPROC
2350 DEF PROC_SWAP
2360 F3=T9(J):T9(J)=T9(J+1):T9(J+1)=F3
2370 F3=F9(J):F9(J)=F9(J+1):F9(J+1)=F3
2380 F3=A9(J):A9(J)=A9(J+1):A9(J+1)=F3
2390 F3=DB(J):DB(J)=DB(J+1):DB(J+1)=F3
2400 F3=D9(J):D9(J)=D9(J+1):D9(J+1)=F3
2410 F3=P9(J):P9(J)=P9(J+1):P9(J+1)=F3
2420 F3=W(J):W(J)=W(J+1):W(J+1)=F3
2430 F3=Q(J):Q(J)=Q(J+1):Q(J+1)=F3
2440 F2=1
2450 ENDPROC
2460 DEF PROCPOSPRINT
2470 PRINT
2480 F$="F ":A4$="A "
2490 IF W6=6 THEN B$=CHR$(I+48)
2500 IF W6=4 THEN B$=CHR$(I+64)
2510 PRINT"GP. ";B$;" LEAGUE TABLE"
2520 FOR J=1TOJ1
2530 IF F9(J)>9 THEN F$=" F "
2540 IF A9(J)>9 THEN A4$=" A "
2550 NEXT J
2560 PRINTTAB(20);" P W D L ";F$;A4$;"Pts."
2570 FOR J=1TOJ1
2580 P4$=" ":P5$=" "
2590 L9=Q(J)-W(J)-D9(J)
2600 IF F$=" F " THEN GOTO 2770
2610 IF A4$=" A " THEN GOTO 2790
2620 Y1$=STR$(J)+". "+A$(T9(J))
2630 PRINTY1$;TAB(21);Q(J);" ";W(J);" ";D9(J);" "
;L9;P4$;F9(J);P5$;A9(J);" ";

```



```

GOTO 1570
1560 ENDPROC
1570 PRINT"RE-ENTER 4 NOS.
FROM ABOVE LIST"
1580 GOTO1520
1590 ENDPROC
1600 DEF PROC_FITTURE
1610 W6=6
1620 D1=12
1630 H2=1:A2=2:PROCRESULT
1640 H2=3:A2=4:PROCRESULT
1650 H2=1:A2=3:PROCRESULT
1660 H2=2:A2=4:PROCRESULT
1670 H2=1:A2=4:PROCRESULT
1680 H2=2:A2=3:PROCRESULT
1690 ENDPROC
1700 DEF PROCRESULT
1710 D1=D1+1
1720 PROCPLAYCHECK
1730 CLS
1740 PRINT"RESULTS FOR ";D1;" JUNE '82"
1750 PRINT
1760 FOR I=1TO6
1770 H=0*(I,H2):A=0*(I,A2)
1780 IF H=T THEN B=P2:C=P3:GOTO 1810
1790 IF T=A THEN B=P3:C=P2:GOTO 1810
1800 GOSUB 2820
1810 PRINT"GP. ";I;" ";A$(H);" ";B;
" ";A$(A);" ";C

```

```

1820 NEXT I
1830 IF D1=18 THEN PROC_CONTINUE:PROCTABLE
1840 PRINT
1850 IF D1=18 THEN ENDPROC
1860 PRINT"PRESS 'L' FOR LEAGUE TABLES"
1870 PRINT"      ANY OTHER KEY TO CONTINUE"
1880 Z$=GET$
1890 IF Z$="" THEN GOTO 1880
1900 IF Z$="L" THEN PROCTABLE
1910 ENDPROC
1920 DEF PROCTABLE

```

```

2640 IF W6+J-5=0 THEN PROC_SEMITEAM
2650 IF W6=4 THEN 2670
2660 IF J<3 THEN PROCY
2670 NEXT J
2680 IF W6=6 THEN 2710
2690 IF I<4 THEN 2760
2700 GOTO 2730

```



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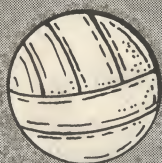
3320 IF J=2 THEN HX(3,2)=T9(J)
3330 GOTO 3240
3340 IF J=1 THEN HX(3,3)=T9(J)
3350 IF J=2 THEN HX(1,3)=T9(J)
3360 GOTO 3240
3370 IF J=1 THEN HX(4,2)=T9(J)
3380 IF J=2 THEN HX(2,2)=T9(J)
3390 GOTO 3240
3400 IF J=1 THEN HX(2,3)=T9(J)
3410 IF J=2 THEN HX(4,3)=T9(J)
3420 GOTO 3240
3430 DEF PROCOPPVAL
3440 IF OX(I,H2) > T THEN Z=OX(I,H2)
3450 IF OX(I,H2)=T THEN Z=OX(I,A2)
3460 PROCGAMEPLAY
3470 ENDPROC
3480 DEF PROCGAMEPLAY
3490 CLS:PRINTA$(T); " V. "; A$(Z):PRINT
3500 B=0:C=0:B4=0:B5=0:B6=0
3510 PROCSCOUTREP:PROCTACTSEL:
PROCOPPTTEAM
3520 Z3=0:Z4=0:W1=0
3530 K4=D*(Z*(T),Z*(Z))+30:
W3=R*(T):W4=R*(Z)
3540 W3=W3+2*I*(F*(T),
F*(Z)):W4=W4+2*I*(F*(Z),F*(T))
3550 FOR I=1TO11:EX(I)=0:NEXT I
3560 U1=0
3570 CLS:PRINT"THE REF BLOWS HIS
WHISTLE TO START GAME"
3580 FOR I=1TOK4
3590 Z1=T
3600 IF FNA(W3+W4)>R*(T) THEN Z1=Z
3610 IF Z1=T THEN ZB=Z
3620 IF Z1=Z THEN ZB=T
3630 PROCDETPOSS
3640 ZB$=" HAVE "
3650 PROCPOSSREG
3660 PRINTA$(Z1);ZB$;"POSSESSION":PRINT
3670 IF Z1=T THEN PROCPLAYRAN
3680 IF Z1=Z THEN PROCANPLAY
3690 J#=Z5#+T4*(G1)+Z6$:PROCMOVEPRI
3700 PRINT:PROCWAIT
3710 Z4=Z2:Z3=Z1
3720 IF Z2=1 THEN U1=U1+1:EX(A3)=EX(A3)+1
3730 IF Z2=2 THEN PROCSCORCHAN
3740 IF I=22 THEN PROCHALTIM
3750 NEXT I
3760 H=T:A=Z
3770 PRINT"NOTHING ELSE OF SIGNIFICANCE
HAPPENS DURING THE GAME"
3780 PRINT:PRINT"FINAL SCORE"
3790 PRINTA$(T); " ";B;" ";A$(Z); " ";C
3800 P2=B:P3=C:PROCCONTINUE
3810 IF X3=0 THEN GOSUB 2990:ENDPROC
3820 IF B=C THEN 3850
3830 IF V=0 THEN ENDPROC
3840 GOSUB 2990:ENDPROC
3850 IF X5=1 THEN 3900
3860 Z3=0:Z4=0:K4=15
3870 X5=1
3880 CLS:PRINT"EXTRA TIME BEING PLAYED"
3890 GOTO 3580
3900 X5=0
3910 CLS:PRINT"PENALTIES WILL DECIDE THE RESULT"
3920 J$=" SHOOT'S WIDE"
3930 IF RND(1)>.5 THEN B=B+1:J$=" SCORES FROM THE SPOT"
3940 J#=K*(1+FNA(10))+J$:PROCMOVEPRI
3950 J$=" SHOOT'S WIDE"
3960 IF RND(1)>.5 THEN C=C+1:J$=" SCORES FROM THE SPOT"
3970 J#=Z9*(1+FNA(10))+J$:PROCMOVEPRI
3980 IF B=C THEN 3920
3990 PRINT"FINAL SCORE ":PRINTA$(T); " ";B;" ";A$(Z); " ";C

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```

2710 IF I<3 THEN 2760
2720 IF (I-4)*(I-5)=0 THEN 2760
2730 PRINT"PRESS ANY KEY TO CONTINUE"
2740 Z$=GET$
2750 IF Z$="" THEN GOTO 2740
2760 ENDPROC
2770 IF F9(J)<10 THEN P4$=" "
2780 GOTO 2610
2790 IF A9(J)<10 THEN P5$=" "
2800 GOTO 2620
2810 ENDPROC
2820 B=0:C=0
2830 IF FNA(100)<60 THEN GOTO 2850
2840 B=I*(F*(H),F*(A)):C=J*(F*(H),F*(A))
2850 B1=FNA(B):C1=FNA(C)
2860 B1=B1+R*(H):C1=C1+R*(A)
2870 D=INT((ABS(B1-C1))/5)
2880 IF D<0 THEN 2950
2890 B=B+FNA(2)-1
2900 C=C+FNA(2)-1
2910 IF FNA(2)=2 THEN GOTO 2990
2920 IF R*(H)>R*(A) THEN B=B+FNA(2)-1
2930 IF R*(A)>R*(H) THEN C=C+FNA(2)-1
2940 GOTO 2990
2950 IF B1>C1 THEN B=B+D
2960 IF C1>B1 THEN C=C+D
2970 IF FNA(500)>498 THEN B=B+FNA(3)
2980 IF FNA(500)>498 THEN C=C+FNA(3)
2990 N*(H)=N*(H)+1:N*(A)=N*(A)+1
3000 M*(H,N*(H))=A
3010 M*(A,N*(A))=H
3020 M*(H,N*(H)+7)=B
3030 M*(A,N*(A)+7)=C
3040 M*(H,N*(H)+14)=C
3050 M*(A,N*(A)+14)=B
3060 RETURN
3070 DEF PROCPLAYCHECK
3080 FOR I=1TOW6
3090 IF (OX(I,H2)-T)*(OX(I,A2)-T)=0
THEN PROCOPPVAL
3100 NEXT I
3110 ENDPROC
3120 DEF PROCX
3130 K1=4:K2=5:J1=3
3140 FOR I=1TO4
3150 FOR J=1TO3
3160 OX(I,J)=HX(I,J)
3170 NEXT J:NEXT I
3180 ENDPROC
3190 DEF PROCSEMITTEAM
3200 S8(I)=T9(J)
3210 ENDPROC
3220 DEF PROCY
3230 ON I GOTO 3250,3280,3310,3340,
3370,3400
3240 ENDPROC
3250 IF J=1 THEN HX(1,1)=T9(J)
3260 IF J=2 THEN HX(3,1)=T9(J)
3270 GOTO 3240
3280 IF J=1 THEN HX(2,1)=T9(J)
3290 IF J=2 THEN HX(4,1)=T9(J)
3300 GOTO 3240
3310 IF J=1 THEN HX(1,2)=T9(J)

```

```

4000 P2=B:P3=C
4010 ENDPROC
4020 DEF PROCSCOUTREP
4030 D4=0
4040 IF (Z-S1)*(Z-S2)*
(Z-S3)*(Z-S4)=0 THEN D4=1
4050 IF D4=1
THEN J$="YOUR SCOUTS
REPORT ON "+A$(Z):PROCMOVEPRI
4060 E=Z
4070 IF D4=1 THEN PROCCONTINUE
4080 PROCREP:ENDPROC
4090 DEF PROCTACTSEL
4100 CLS:PRINT"WHAT FORMATION
SHALL WE PLAY BOSS?"

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```

4420 PROCFREEDEF
4430 PRINTF1;" ";C$
4440 NEXT F1
4450 PROCZ:UX(T)=E9:PRINT
4460 PRINT"WHAT SHALL WE DO WITH
OUR CORNERS?"
4470 FOR F1=1TO3
4480 PROCCORNTACT
4490 PRINTF1;" ";C$
4500 NEXT F1
4510 PROCZ:VX(T)=E9:PRINT
4520 PRINT"WHAT ABOUT THEIR CORNERS?"
4530 FOR F1=1TO3
4540 PROCCORNDEF
4550 PRINTF1;" ";C$
4560 NEXT F1
4570 PROCZ:WX(T)=E9
4580 ENDPROC
4590 DEF PROCOPPTTEAM
4600 CLS:PRINT"DO YOU WISH TO TYPE
IN THE OPPOSITION PLAYERS' NAMES?"
4610 INPUT"TYPE Y OR N "D3$
4620 IF ASC(LEFT$(D3$,1))=78 THEN
PROCCOPNAME:ENDPROC
4630 IF ASC(LEFT$(D3$,1))(>)89 THEN 4610
4640 FOR I=1TO12
4650 PRINT"ENTER NAME OF PLAYER ";I:
IF I=1 THEN
PRINT CHR$(136);"--MAXIMUM OF 5 LETTERS--"
4660 INPUT Z9$(I)
4670 IF LEN(Z9$(I))>15 THEN PRINT"NAME
IS TOO LONG. RE-ENTER.":GOTO 4660.

```

```

5030 NEXT J
5040 GOTO 4980
5050 ENDPROC
5060 DEF PROCSCORCHAN
5070 Z4=1:G3=FNA(7)
5080 IF G1<8 THEN Z1$=Z6$
5090 IF G1>7 THEN Z1$=Z5$
5100 ON G3 GOSUB 5120,5120,5120,5120,5160,5160,5250
5110 ENDPROC
5120 G3=FNA(100)
5130 IF C$(Y$(Z3),X$(Z8))>100-G3+B4 THEN PROCgoal:RETURN
5140 PROCA

```

```

4110 FOR F1=1TO3
4120 PROCFORM
4130 PRINTF1;" ";C$
4140 NEXT F1
4150 PROCZ:F$(T)=E9:PRINT
4160 PRINT"WHAT ARE THE DEFENCE PLANS BOSS?"
4170 FOR F1=1TO3
4180 PROCDEFTACT
4190 PRINTF1;" ";C$
4200 NEXT F1
4210 PROCZ:X$(T)=E9:PRINT
4220 PRINT"WHAT ATTACK PLANS GUV?"
4230 FOR F1=1TO3
4240 PROCCATTACT
4250 PRINTF1;" ";C$
4260 NEXT F1
4270 PROCZ:Y$(T)=E9:PRINT
4280 PRINT"WHAT ABOUT MIDFIELD BOSS?"
4290 FOR F1=1TO3
4300 PROCMIDTACT
4310 PRINTF1;" ";C$
4320 NEXT F1
4330 PROCZ:Z$(T)=E9:PRINT
4340 PRINT"WHAT IF WE GET A FREEKICK UPFIELD BOSS?"
4350 FOR F1=1TO3
4360 PROCFREETACT
4370 PRINTF1;" ";C$
4380 NEXT F1
4390 PROCZ:T$(T)=E9:PRINT
4400 PRINT"HOW DO WE DEFEND AGAINST A FREEKICK?"
4410 FOR F1=1TO3

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```

4680 NEXT I
4690 ENDPROC
4700 DEF PROCDETPOSS
4710 G1=FNA(20)
4720 IF G1<4 THEN Z2=1
4730 IF G1<4 THEN ENDPROC
4740 IF G1>17 THEN Z2=1
4750 IF G1>17 THEN ENDPROC
4760 Z2=2:ENDPROC
4770 DEF PROCPOSSREG
4780 IF Z4<>1 THEN ENDPROC
4790 IF Z3<>Z1 THEN ENDPROC
4800 Z8$=" REGAIN "
4810 ENDPROC
4820 DEF PROCPLAYRAN
4830 A3=FNA(10)+1:Z5$=K$(A3)
4840 IF G1>10 THEN Z6$=Z9$(FNA(10)+1)
4850 IF G1>10 THEN ENDPROC
4860 A4=FNA(10)+1
4870 IF A4=A3 THEN 4860
4880 Z6$=K$(A4)
4890 ENDPROC
4900 DEF PROCNANPLAY
4910 A3=FNA(10)+1:Z5$=Z9$(A3)
4920 IF G1>10 THEN Z6$=K$(FNA(10)+1)
4930 IF G1>10 THEN ENDPROC
4940 A4=FNA(10)+1
4950 IF A4=A3 THEN 4940
4960 Z6$=Z9$(A4):ENDPROC
4970 DEF PROCMOVEPRI
4980 IF LEN(J$)<=39 THEN PRINTJ$
4990 IF LEN(J$)<39 THEN PRINT
5000 IF LEN(J$)<=39 THEN ENDPROC
5010 FOR J=39TO1 STEP-1
5020 IF ASC(MID$(J$,J,1))=32 THEN PRINT
LEFT$(J$,J):J$=RIGHT$(J$,LEN(J$)-J):J=0

```



```

5150 RETURN
5160 PRINT:PRINTA$(Z1); " WIN A CORNER"
5170 IF Z1=T THEN Z1#=K$(5+FNA(6))
5180 IF Z1=Z THEN Z1#=Z9$(5+FNA(6))
5190 J#="FROM THE KICK THE BALL REACHES"+" "+Z1$
5200 PROCMOVEPRI
5210 G3=FNA(100)
5220 IF B%(Y%(Z3),X%(Z8))>100-G3+B6 THEN B6=B6+2:PROCGOAL:RETURN
5230 PROCA
5240 RETURN
5250 PRINT
5260 IF Z1=T THEN Z5#=Z9$(1+FNA(4))
5270 IF Z1=Z THEN Z5#=K$(1+FNA(4))
5280 J#=Z1#+ " IS BROUGHT DOWN BY "+Z5#+ ". THE REF AWARDS "+A$(Z1)
5290 J#=J#+ " A FREEKICK JUST OUTSIDE THE BOX":PROCMOVEPRI
5300 PRINT:PRINT"FROM THE FREEKICK "
5310 G3=FNA(100)
5320 IF C%(Y%(Z3),X%(Z8))>100-G3+B5 THEN B5=B5+2:PROCGOAL:RETURN
5330 PROCA
5340 RETURN
5350 DEF PROCHALTIM
5360 PRINT:PRINT"HALFTIME SCORE:"
5370 PRINTA$(T); " ";B; " ";A$(Z); " ";C
5380 PRINT"DO YOU WISH TO CHANGE TACTICS?"
5390 INPUT "TYPE 'Y' OR 'N' " Z$
5400 IF ASC(LEFT$(Z$,1))<>78 AND ASC(LEFT$(Z$,1))<>89 THEN 5390
5410 IF ASC(LEFT$(Z$,1))=89 THEN PROCTACTSEL
5420 PROCSUB:ENDPROC
5430 DEF PROCREP
5440 PRINT"PROFILE ON ";A$(E):PRINT
5450 PROCPASTRES
5460 PRINT:F1=X%(E)
5470 PROCDEFTACT
5480 PRINT
5490 PRINT"IN DEFENCE THEY";C$:PRINT
5500 F1=Y%(E):PROCATTACT
5510 PRINT"IN ATTACK THEY USE THE";C$:PRINT
5520 F1=Z%(E):PROCMIDTACT
5530 PRINT"IN MIDFIELD THEY";C$:PRINT
5540 IF D4=0 THEN PROCONTINUE:ENDPROC
5550 F1=T%(E):PROCFREETACT
5560 PRINT"IN FREEKICKS AROUND THE BOX THEY USE A":PRINTC$
5570 F1=U%(E):PROCFREEDEF
5580 PRINT"AND DEFENDING AGAINST FREEKICKS THEY":PRINTC$:PRINT
5590 F1=V%(E):PROCCORNTACT
5600 PRINT"FROM A CORNER THEY";C$
5610 F1=W%(E):PROCCORNDEF
5620 PRINT"WHEN FACED WITH A CORNER THEY":PRINTC$:PRINT
5630 F1=F%(E):PROCFORM
5640 PRINT"THEY NORMALLY PLAY";C$;"FORMATION":PRINT

```

```

5650 PROCONTINUE
5660 ENDPROC
5670 DEF PROCFORM
5680 IF F1=1 THEN C$=" A 4-3-3 "
5690 IF F1=2 THEN C$=" A 4-4-2 "
5700 IF F1=3 THEN C$=" A 4-2-4 "
5710 ENDPROC
5720 DEF PROCDEFTACT
5730 IF F1=1 THEN C$=" USE A SWEEPER "
5740 IF F1=2 THEN C$=" INTERCEPT PASSES "
5750 IF F1=3 THEN C$=" SHADOW ATTACKERS "
5760 ENDPROC
5770 DEF PROCATTACT
5780 IF F1=1 THEN C$=" FAST BREAK "
5790 IF F1=2 THEN C$=" EARLY CROSS "
5800 IF F1=3 THEN C$=" SLOW BUILD-UP "
5810 ENDPROC
5820 DEF PROCMIDTACT
5830 IF F1=1 THEN C$=" TACKLE HARD "
5840 IF F1=2 THEN C$=" MARK TIGHTLY "
5850 IF F1=3 THEN C$=" FIND SPACE "
5860 ENDPROC
5870 DEF PROCFREETACT
5880 IF F1=1 THEN C$=" DIRECT SHOT "
5890 IF F1=2 THEN C$=" CHIP TO THE FAR POST "
5900 IF F1=3 THEN C$=" TEE-UP FOR SHOT "

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```
5910 ENDPROC
5920 DEF PROCFREEDEF
```



```
5930 IF F1=1 THEN C$=" MAKE A WALL "
5940 IF F1=2 THEN C$=" MARK MAN-TO-MAN "
5950 IF F1=3 THEN C$=" RUSH THE KICKER "
5960 ENDPROC
5970 DEF PROCCORNTACT
5980 IF F1=1 THEN C$=" PLAY IT SHORT "
5990 IF F1=2 THEN C$=" AIM FOR THE FAR POST "
6000 IF F1=3 THEN C$=" AIM FOR THE NEAR POST "
6010 ENDPROC
6020 DEF PROCCORNDEF
6030 IF F1=1 THEN C$=" MOVE OUT FAST "
6040 IF F1=2 THEN C$=" RELY ON THE GOALKEEPER "
6050 IF F1=3 THEN C$=" USE CLOSE MARKING "
6060 ENDPROC
6070 DEF PROCZ
6080 INPUT "ENTER A NO. BETWEEN 1 & 3:"E$
6090 IF LEN(E$)>1 THEN 6140
6100 IF ASC(E$)<49 THEN 6140
6110 IF ASC(E$)>51 THEN 6140
6120 E9=VAL(E$)
6130 ENDPROC
6140 PRINT"PLEASE RE-ENTER"
6150 GOTO 6080
6160 ENDPROC
```

```
6170 DEF PROCOPNAME
6180 FOR I=1TO12
6190 Z9$(I)="NO."+STR$(I)
6200 NEXT I
6210 Z9$(1)="THEIR GOALKEEPER "
6220 ENDPROC
6230 DEF PROCgoal
6240 PRINT
6250 B4=B4+2.5:J$=Z1$+A2$(FNA(9)):PROCMOVEPRI
6260 PROCSCORE:PROCSUB
6270 IF I=K4 THEN ENDPROC
6280 PRINT"FROM THE KICK-OFF"
6290 ENDPROC
6300 DEF PROCSCORE
6310 J$="IT'S A GOAL! "+A$(Z1)+" HAVE SCORED":PROCMOVEPRI
6320 IF Z1=T THEN B=B+1
6330 IF Z1=Z THEN C=C+1
6340 D2=I*2
6350 IF RND(1)>.5 THEN D2=D2-1
6360 PRINT
6370 Z$=" MINUTES"
6380 IF D2=1 THEN Z$=" MINUTE"
6390 PRINT"SCORE AFTER ";D2;Z$
6400 PRINT:PRINT A$(T);" ";B;" ";A$(Z);" ";C
6410 Z2=1:ENDPROC
6420 DEF PROCa
6430 G3=FNA(9):Z1$=Z1$+A1$(G3)
6440 IF Z8=T THEN H$=" "+K$(1+FNA(4))
6450 IF Z8=Z THEN H$=" "+Z9$(1+FNA(4))
6460 IF G3<4 THEN Z1$=Z1$+H$
6470 IF G3<4 THEN J$=Z1$:PROCMOVEPRI:Z2=1:ENDPROC
6480 IF Z8=T THEN H$=" "+K$(1)
6490 IF Z8=Z THEN H$=" "+Z9$(1)
6500 IF G3<6 THEN J$=Z1$+H$:PROCMOVEPRI:ENDPROC
6510 J$=Z1$:PROCMOVEPRI:ENDPROC
6520 DEF PROCSUB
6530 IF W1=1 THEN PROCCONTINUE:ENDPROC
6540 PRINT"PRESS 'S' TO BRING ON SUBSTITUTE":PRINT"        ANY OTHER KEY TO CONT
INUE"
6550 Z$=GET$
6560 IF Z$="" THEN 6550
6570 IF ASC(Z$)<>83 THEN ENDPROC
6580 CLS:W1=1
6590 W1=1
6600 FOR J=2TO11:PRINTJ;" ";K$(J):NEXT J
6610 PRINT"ENTER A NO. FROM 2 TO 11":PRINT"TO SHOW THE PLAYER TO BE SUBSTITUTE
D"
6620 INPUT K
6630 IF K>11 THEN 6620
6640 IF K<2 THEN 6620
6650 PRINT:J$=K$(K)+" TRUDGES OFF TO BE REPLACED BY "+K$(12):PROCMOVEPRI
6660 Z$=K$(K):K$(K)=K$(12):K$(12)=Z$
6670 W3=W3+(-(U1/10)+E%(K))*2
```



```

6680 ENDPROC
6690 DEF PROCPASTRES
6700 IF N%(E)=0 THEN ENDPROC
6710 PRINT:PRINT"RESULTS SO FAR":PRINT
6720 FOR I=1TON%(E)
6730 PRINTA$(E);" ";M%(E,I+7);" ";A$(M%(E,I));" ";M%(E,I+14)
6740 NEXT I
6750 PRINT:PROCCONTINUE
6760 ENDPROC
6770 DEF PROCSECTAGE
6780 CLS:PRINT"GROUPS FOR THE 2ND. STAGE ARE :-":PRINT
6790 FOR I=1TO2
6800 PRINT"GP. ";CHR$(64+I);TAB(20);"GP. ";CHR$(66+I)
6810 PRINT
6820 FOR J=1TO3
6830 PRINTA$(H%(I,J));TAB(20);A$(H%(I+2,J))
6840 NEXT J
6850 PRINT
6860 NEXT I
6870 ENDPROC
6880 DEF PROCSECFIXT
6890 W6=4:D1=27
6900 H2=1:A2=2:PROCSECREs
6910 H2=3:A2=1:PROCSECREs
6920 H2=2:A2=3:PROCSECREs
6930 ENDPROC
6940 DEF PROCSECREs
6950 PROCJ:PROCPLAYCHECK
6960 CLS:PRINT"RESULTS FOR ";D1;" JUNE '82"
6970 PRINT
6980 FOR I=1TO4
6990 H=H%(I,H2):A=H%(I,A2)
7000 IF H=T THEN B=P2:C=P3:GOTO 7030
7010 IF T=A THEN B=P3:C=P2:GOTO 7030
7020 GOSUB 2820
7030 PRINT"GP. ";CHR$(I+64);" ";A$(H);" ";B;" ";A$(A);" ";C
7040 NEXT I
7050 IF D1=29 THEN PROCCONTINUE:PROCTABLE
7060 PRINT
7070 IF D1=29 THEN ENDPROC
7080 PRINT"PRESS 'L' TO SHOW LEAGUE TABLES":PRINT"
NUE"

```

ANY OTHER KEY TO CONT

```

7090 Z$=GET$
7100 IF Z$="" THEN GOTO 7090
7110 IF Z$="L" THEN PROCTABLE
7120 D1=D1+1:ENDPROC
7130 DEFPROCJ
7140 FOR I=1TO4
7150 FOR J=1TO3
7160 O%(I,J)=H%(I,J)
7170 NEXT J:NEXT I
7180 ENDPROC
7190 DEF PROCSEMI
7200 CLS:PRINT"SEMI-FINALS":PRINT"==== ====="
7210 FOR I=1TO4
7220 PRINT
7230 NEXT I
7240 PRINTA$(S8(1));TAB(16);"V. ";A$(S8(3))
7250 FOR I=1TO4
7260 PRINT
7270 NEXT I
7280 PRINTA$(S8(2));TAB(16);"V. ";A$(S8(4))
7290 FOR I=1TO6
7300 PRINT
7310 NEXT I
7320 PROCCONTINUE
7330 ENDPROC
7340 DEF PROCSEMIPLAY
7350 CLS:PRINT"BARCELONA 8th JULY 1982":PRINT
7360 PRINT"SEMI-FINAL":PRINT
7370 PRINTA$(S8(1));" V. ";A$(S8(3))
7380 X3=1
7390 PROCWAIT
7400 X1=S8(1):X2=S8(3)

```




```

7410 PROC R
7420 CLS:PRINT"SEVILLE 8th JULY 1982":PRINT
7430 PRINT"SEMI-FINAL":PRINT
7440 E2=0:E1=0
7450 PRINTA$(S8(2));" V. ";A$(S8(4))
7460 PROC WAIT
7470 X1=S8(2):X2=S8(4)
7480 PROC R
7490 ENDPROC
7500 DEF PROC B
7510 FOR I=1 TO 90
7520 IF RND(1)>86/90 THEN PROC D
7530 IF I=45 THEN PROC E
7540 IF I/10=INT(I/10) THEN PROC F
7550 NEXT I
7560 IF E1=E2 THEN PROC G
7570 PRINT"FINAL SCORE"
7580 PRINTA$(X1);" ";E1;" ";A$(X2);" ";E2
7590 ENDPROC
7600 DEF PROC C
7610 W5=W5+1
7620 IF V=1 THEN ENDPROC
7630 IF E1>E2 THEN N1(W5)=X1
7640 IF E2>E1 THEN N1(W5)=X2
7650 ENDPROC
7660 DEF PROC D
7670 R7=RND(1)
7680 CLS:R9=R$(X1)/(R$(X1)+R$(X2))
7690 IF R7=R9 THEN 7670
7700 IF R7<R9 THEN J$=A$(X1)+" HAVE SCORED AFTER "+STR$(I)+" MINUTES"
7710 IF I=1 THEN J$=LEFT$(J$,LEN(J$)-1)
7720 IF R7<R9 THEN PROC MOVEPRI
7730 IF R7<R9 THEN E1=E1+1
7740 IF R7>R9 THEN J$=A$(X2)+" HAVE SCORED AFTER "+STR$(I)+" MINUTES"
7750 IF R7>R9 THEN PROC MOVEPRI
7760 IF R7>R9 THEN E2=E2+1
7770 PROC WAIT:ENDPROC
7780 DEF PROC E
7790 PRINT:PRINT"HALF TIME SCORE:"
7800 PRINT:PRINTA$(X1);" ";E1;" ";A$(X2);" ";E2:PRINT
7810 PROC WAIT:ENDPROC
7820 DEF PROC F
7830 CLS:PRINT"SCORE AFTER ";I;" MINUTES ";":"
7840 PRINTA$(X1);" ";E1;" ";A$(X2);" ";E2
7850 PROC WAIT:ENDPROC
7860 DEF PROC G
7870 CLS:PRINT"AFTER EXTRA TIME"
7880 R4=FNA(2)
7890 IF R4=1 THEN E1=E1+FNA(3)
7900 IF R4=2 THEN E2=E2+FNA(3)
7910 PROC WAIT:ENDPROC
7920 DEF PROC FINAL
7930 V=1:CLS:PRINT"MADRID 11th JULY 1982"
7940 FOR I=1 TO 6
7950 PRINT
7960 NEXT I
7970 PRINT"CUP FINAL":PRINT"==== ====="
7980 PRINTA$(N1(1));" V. ";A$(N1(2))
7990 PROC WAIT:PROC WAIT
8000 CLS:E1=0:E2=0:X1=N1(1):X2=N1(2)
8010 IF X1=T THEN Z=X2:PROCGAMEPLAY:E1=B:E2=C:GOTO 8040
8020 IF X2=T THEN Z=X1:PROCGAMEPLAY:E1=C:E2=B:GOTO 8040
8030 PROC B:PROC C:
8040 ENDPROC
8050 DEF PROC R
8060 IF X1=T THEN Z=X2:PROCGAMEPLAY:E1=B:E2=C:PROCC:GOTO 8090
8070 IF X2=T THEN Z=X1:PROCGAMEPLAY:E1=C:E2=B:PROCC:GOTO 8090
8080 PROC B:PROC C:
8090 N$(X1)=N$(X1)+1
8100 M$(X1,6)=X2:M$(X1,13)=E1:M$(X1,20)=E2
8110 N$(X2)=N$(X2)+1
8120 M$(X2,6)=X1:M$(X2,13)=E2:M$(X2,20)=E1
8130 IF (X1-T)*(X2-T)<>0 THEN PROCCONTINUE
8140 ENDPROC

```


BOMBER

BY JANEK SIRRS

RUNS ON A BBC MODEL A IN 16K

Ace pilots only need apply for this little excursion into the wild blue yonder. Well, it's not really the flying you have to worry about. It's getting your undercarriage planted firmly back on the ground that's the problem.

You must try to land your ancient fighter plane in the middle of a city. To do this you must create a makeshift runway by bombing the skyscrapers. But you are running out of fuel — so your time is very limited.

```

10 REM *** BOMBER by J.Sirrs, 1982 ***
20 HISCORE%=0
30 MODE5:PROCinit:PROCtitle:MODE4:PROCinst: !&FE00=&10200A
40 PROCscreen
50 PX%=PX%+1: IF ?FNS (PX%+2, PY%, N%)=126 THEN PROCcrash: GOTO370
60 IF PX%=40 AND PY%<>29 THEN PRINTTAB (PX%-1, PY%); " " ; PX%=0: PY%=PY%+1
70 IF PX%=37 AND PY%=29 THEN PROCland: GOTO40
80 IF PX%=0 GOTO90 ELSE PRINTTAB (PX%-1, PY%) " "; PLANE$;
90 I%=INKEY (0): IF I%>0 AND BOMB%=0 THEN PROCcreatebomb
100 IF BOMB%=1 THEN PROCmovebomb
110 PRINTTAB (11, 1); SCORE%: FOR L%=1 TO 400: NEXT L%: GOTO50
120 DEF PROCcreatebomb
130 BOMB%=1: BX%=PX%: BY%=PY%
140 ENDPROC
150 DEF PROCmovebomb
160 FOR L%=1 TO 2: IF BY%=PY% AND BX%=PX% GOTO170 ELSE PRINTTAB (BX%, BY%); " "
170 BY%=BY%+1: IF ?FNS (BX%, BY%, N%)=126 THEN PROCexplosion: SCORE%=SCORE%+1: GOTO210

180 IF BY%>29 THEN L%=3: BOMB%=0: GOTO210
190 IF BOMB%=0 THEN L%=3: GOTO210
200 PRINTTAB (BX%, BY%); CHR$ (227): SOUND1, -15, BY%*2, 1
210 NEXT L%: ENDPROC
220 DEF PROCexplosion
230 FOR E%=0 TO RND (4): SOUND0, -15, 4, 1: IF (Y%+E%>29 THEN E%=5: NEXT E%: L%=3: BOMB%=0: ENDPROC
240 PRINTTAB (BX%, BY%+E%); " " ; NEXT E%
250 BOMB%=0: L%=3: ENDPROC
260 DEF PROCland
270 FOR L%=1 TO 50: SOUND1, -15, L%, .05: NEXT L%
280 FOR L%=1 TO 20: IFL%/2=INT (L%/2) THEN CH% = 228 ELSE CH% = 229
290 PRINTTAB (35, 29); CHR$ (CH%): FOR D%=1 TO 750: NEXT D%: NEXT L%
300 PRINTTAB (12, 12); "100 BONUS POINTS": FOR L%=1 TO 5000: NEXT L%: PRINTTAB (12, 12) "
    ": SCORE%=SCORE%+100
310 PRINTTAB (35, 29); " " ; CHR$ (30)
320 PY%=29: FOR PX%=8 TO 36: PRINTTAB (PX%-1, PY%); " " ; PY%=PY%-.2: PRINTTAB (PX%, PY%)
; PLANE$: FOR D%=1 TO 500: NEXT D%: NEXT PX%
330 SK%=SK%+1: PX%=1: PY%=3: ENDPROC
340 DEF PROCcrash
350 FOR L%=1 TO 20: VDU19, 0, RND (15), 0, 0, 0, 19, 1, RND (15), 0, 0, 0: SOUND0, -15, RND (3)+3, 1
; NEXT L%
360 VDU19, 0, 6, 0, 0, 0, 19, 1, 0, 0, 0, 0: ENDPROC
370 CLS: VDU19, 0, 0, 0, 0, 0, 19, 1, 4, 0, 0, 0
380 PRINT " " "Oh dear you appear to have crashed your"
390 PRINT "plane!!!!"
400 PRINT " " "Your final score was :- "; SCORE%; " points."
410 IF SCORE%>HISCORE% THEN HISCORE%=SCORE%: PRINT " " "Wow! You've just got the best
score yet."
420 PRINT " " "Today's high score is :- "; HISCORE%: SCORE%=0: PX%=1: PY%=3: BOMB%=0
430 PRINT " " "TAB(8) "ANOTHER GAME (Y/N) ?"
440 A$=GET$: IFA$="Y" GOTO30 ELSE GOTO450
450 MODE7: END
460 DEF PROCscreen
470 CLS: VDU17, 0, 4, 0, 0, 0, 19, 1, 7, 0, 0, 0
480 PRINTTAB (5, 1); "SCORE: "; SCORE%; TAB (20, 1); "HI-SCORE: "; HISCORE%
490 PRINTTAB (0, 30); STRING$ (40, CHR$ (233)); CHR$ (30)
500 FOR L%=3 TO 36: BH%=RND (3*SK%): PRINTTAB (L%, 29); : FOR B%=1 TO BH%: PRINTCHR$ (231); CH
R$ (11); CHR$ (8); : SOUND1, -15, B%*3, 1: NEXT B%: PRINTCHR$ (230): NEXT L%
510 PRINTTAB (PX%, PY%); PLANE$
520 ENDPROC
530 DEF PROCinit

```



```

540 VDU23,224,24,28,31,0,0,0,0,0
550 VDU23,225,63,5,255,255,15,2,7,7
560 VDU23,226,228,4,244,252,244,4,4,0
570 VDU23,227,126,60,24,60,60,60,60,24
580 VDU23,228,60,60,24,126,153,36,66,129
590 VDU23,229,189,189,153,126,24,36,66,129
600 VDU23,230,0,24,60,126,126,90,90,126
610 VDU23,231,126,90,90,126,126,90,90,126
620 VDU23,232,0,0,50,126,126,90,90,126
630 VDU23,233,255,255,255,255,255,255,255
640 PLANE$=CHR$(224)+CHR$(225)+CHR$(226)
650 SCORE%=0:PX%=1:PY%=3:BX%=0:BY%=0:BOMB%=0:N%=4
660 DEF FNS(X,Y,N)=HMEM+(Y*40+X)*8+N
670 ENDPROC
680 DEFPROCinst
690 CLS:VDU19,3,9,0,0,0:PRINTTAB(5,14);"Do you need instructions (Y/N) ?"
700 A$=GET$:IFA$="Y"GOTO710 ELSEIFA$="N"GOTO 790 ELSEGOTO700
710 CLS:VDU19,1,3,0,0,0:COLOUR1:PRINTTAB(13,1);"B O M B E R"
720 PRINT"" Try to land your ancient fighter plane"
730 PRINT"" by destroying all the city skyscrapers"
740 PRINT"" to create a makeshift runway!"
750 PRINT"" Bombs are dropped by pressing any key."
760PRINT"" WARNING - your fuel is limited!!"
770 PRINT"""" PRESS ANY KEY TO START YOUR FLIGHT"
780 A$=GET$
790 CLS:PRINTTAB(5,12);"What is your skill level (1-3)?"
800 A$=GET$:SK%=VAL(A$):IFSK%>3ORSK%<1GOTO790 ELSEENDPROC
810 DEFPROCtitle
820 CLS:VDU19,0,0,0,0,0,19,3,2,0,0,0
830 TL$="B O M B E R":FORL%=1TOLEN(TL$):COLOUR3:PRINTTAB(L%+3,10);" ":PLANE$:F
ORB%=1TO4
840 COLOUR2:PRINTTAB(L%+5,11+B%);" ":CHR$(10);CHR$(8);CHR$(227):SOUND1,-15,B%*
2,1:NEXTB%:COLOUR1:PRINTTAB(L%+5,16);MID$(TL$,L%,1);:SOUND0,-15,5,1:FORD%=1TO100
:NEXTD%:NEXTL%
850 FORL%=1TO12000:NEXTL%:ENDPROC

```

ALIEN ATTACK

BY R. PHELPS

RUNS ON A SHARP MZ80K

IN 16K

A vast fleet of alien craft is sweeping majestically toward your tiny space fighter — the only surviving defender of a race doomed to destruction. Doomed unless you can stop the attackers.

You have to knock out the alien battleships one by one while their mother ship dodges up and down the screen attempting to wipe you off the face of the universe.

Unfortunately for you this mothership is invulnerable. But the following fleet can be destroyed. You simply need to be a good marksman.

```

1 REM
2 REM
3 REM
4 REM
5 REM
6 REM
7 REM
8 REM
9 REM *** INSTRUCTIONS ***
10 PRINT"*****ALIEN ATTACK*****"
11 PRINT"
12 PRINT"  I  - UP      I  - DOWN  I  - FIRE"
13 PRINT"
14 PRINT"B Try to destroy the alien space craft,"
15 PRINT"without getting destroyed yourself by"
16 PRINT"the mother craft.BEWARE! The mother ship"
17 PRINT"Is indstructable!BOMB! Now input the skill"
18 GETA$:IF VAL(A$)<1)+(VAL(A$)>6)THENGOTO19
19 CH=VAL(A$)+2
20 POKE4514,A:POKE4513,A:USR(68)
21 R=(999*AND(10))+53248
22 FORA=0TO24:POKE53275+(A*40),206:NEXT
23 REM *** SET UP GAME ***
24 Y=81:D=65:M=90:P=42:S=200:E=161:X=53740:POKE10167,1:I=17828:F=46:N=206
25 POKEX,S:POKEJ,I
30 REM *** START GAME ***
31 IFPEEK(I)=YTHENIFX=53260THENPOKEJ,0:POKEJ-1,0:X=X-40:POKEJ,S:POKEJ-1,E
32 IF 0=0 THEN IFPEEK(I)=54208THEN POKEJ,0:POKEJ-1,0:X=X+40:POKEJ,S:POKEJ-1,E
33 IF J=U+13THEND=0:POKEJ-1,0:POKEJ-1,0:POKEJ,S:POKEJ-1,E
34 IF J=U+13THEND=0:POKEJ-1,0:POKEJ-1,0:POKEJ,S:POKEJ-1,E
35 IF J=U+13THEND=0:POKEJ-1,0:POKEJ-1,0:POKEJ,S:POKEJ-1,E
36 IF J=U+13THEND=0:POKEJ-1,0:POKEJ-1,0:POKEJ,S:POKEJ-1,E
37 IF J=U+13THEND=0:POKEJ-1,0:POKEJ-1,0:POKEJ,S:POKEJ-1,E
38 IF J=U+13THEND=0:POKEJ-1,0:POKEJ-1,0:POKEJ,S:POKEJ-1,E
39 IF J=U+13THEND=0:POKEJ-1,0:POKEJ-1,0:POKEJ,S:POKEJ-1,E
40 IF J=U+13THEND=0:POKEJ-1,0:POKEJ-1,0:POKEJ,S:POKEJ-1,E
41 IFPEEK(U-1)=STHENGOTO45
42 IFU=C-10THEN R=0:POKEU,0:U=0:POKEC+1,199
43 IFU>0THEN U=U-1:POKEU,P:POKEU+1,0
44 GOTO 30
45 REM *** YOU LOST A SHIP ***
46 POKEU,0:FORA=1TO20:POKEJ,S:POKEJ-1,E
47 TEMP07:MUSIC"FOG"ND"E"GA"
48 POKEJ-1,208:POKEJ,208:NEXT
49 PRINT"*****YOU SCORE=SC+W"
50 PRINT"*****YOU PLEASD WITH IT ?"
51 GETA$:IF A$="Y" THEN PRINT"*****BIG HEAD !!!":GOTO55
52 IF A$="N" THEN PRINT"*****SHOULD THINK NOT !!!":GOTO55
53 FORA=1TO500:NEXT:PRINT"*****WOULD YOU LIKE ANOTHER GO (Y/N) ?"
54 GETA$:IF A$="Y" THEN PRINT"*****GO O O B Y E ! !":END
55 GOTO56
56 GOTO56
57 GOTO56
58 GOTO56

```


S.O.S MISSION

BY NIGEL STUART

RUNS ON A 4000 SERIES PET

"Welcome captain. You are now in charge of the space fleet's newest most advanced battlecruiser. Your mission, should you accept it, is to pilot this craft into a tunnel on the enemy planet and destroy as many of their underground bases, ammunition and fuel dumps as possible . . ."

This is a version of arcade Scramble and all the rules of the video version apply. You gain extra fuel for your craft by bombing the fuel and ammunition dumps. Full instructions are included in the program.

To alter the program to run on a 3000 or 2000 series Pet the peek or find which key is being pressed must be changed. This is peek 151 and the value is held in variable Q. The movement of the tunnels is held in B\$, C\$, D\$, E\$, F\$, and G\$.

IN 16K

```
1 PRINT"Q"
10 POKE59467,16:POKE59466,7
:P=59464:POKEP,0
11 DIMS$(10):DIMS(10)
15 FOR X=1 TO 10:S(X)=0:NEXTX
20 DIME(10)
30 E(1)=33230
31 E(2)=33189
32 E(3)=33145
34 E(4)=33150
35 E(5)=33179
36 E(7)=33303
37 E(6)=33262
38 E(8)=33197
39 E(9)=33233
40 E(10)=33151
90 A$="":B$="":C$="":D$="":E$="":
F$="":G$="":FORF=1TO200:NEXTF
91 K=0
95 GOSUB 6000
```

```
100 PRINT"#####S.O.S. MISSION"
110 PRINT"#####"
120 SH=33218:SS=33244:SS=0:SE=33204
130 PRINT"#####FUEL | SCORE | AMO |"
140 PRINT"#####FUEL | SCORE | AMO |"
150 PRINT"#####FUEL | SCORE | AMO |"
160 PRINT"#####FUEL | SCORE | AMO |"
170 PRINT"#####FUEL | SCORE | AMO |"
300 FU=999:SC=0:AM=30
800 A$="#####"
805 AA$=""
810 B$=B$+"#####"
815 B$=B$+"#####"
816 B$=B$+"#####"
820 C$=C$+"#####"
825 C$=C$+"#####"
827 C$=C$+"#####"
830 D$=D$+"#####"
835 D$=D$+"#####"
837 D$=D$+"#####"
840 E$=E$+"#####"
845 E$=E$+"#####"
847 E$=E$+"#####"
850 F$=F$+"#####"
855 F$=F$+"#####"
857 F$=F$+"#####"
860 G$=G$+"#####"
865 G$=G$+"#####"
867 G$=G$+"#####"
```

```
970 B$=A$+B$
971 C$=AA$+C$
972 D$=AA$+D$
973 E$=AA$+E$
974 F$=AA$+F$
975 G$=A$+G$
```

```
980 PRINT"#####"
981 PRINT"#####/"
982 PRINT"#####/"
983 PRINT"#####"
```




```

990 FOR ZX=1 TO LEN(B$)-42
991 IF S5=38 THEN GOSUB 2700
992 S9=S7:S7=S6-S8:IFS8=38 THEN GOSUB2751
993 S4=S3-S5:S5=S5+2:S8=S8+2
994 LL=INT(RND(0)*3)-1:S7=S7+(LL*40)
995 POKES4,115:POKES4+1,246:POKES4+3,
32:POKES4+2,32
996 IF K>0 THEN POKES7,60:POKES7+1,92:
POKES7+2,32:POKES7+3,32
999 IF K>0 THEN POKES7,60:POKES7+1,92:
POKES7+2,32:POKES7+3,32

```

```

1000 B$=MID$(B$,2,LEN(B$))
1010 C$=MID$(C$,2,LEN(C$))
1020 D$=MID$(D$,2,LEN(D$))
1030 E$=MID$(E$,2,LEN(E$))
1040 F$=MID$(F$,2,LEN(F$))
1050 G$=MID$(G$,2,LEN(G$))
1110 PRINT"#####"
1120 PRINTMID$(B$,1,39)
1130 PRINTMID$(C$,1,39)
1140 PRINTMID$(D$,1,39)
1145 PRINT"###"
1150 PRINTMID$(E$,1,39)
1160 PRINTMID$(F$,1,39)
1170 PRINTMID$(G$,1,39)

```

```

1180 A1=PEEK(SH):A2=PEEK(SH+1):A3=PEEK(SH+2)
1300 POKESH,108:POKESH+1,111:POKESH+2,100:POKESH+3,32
1310 POKEP,210:POKEP,180:POKEP,230:POKEP,240:POKEP,0:S2=SH
1320 IF B>1 THEN SH=SH-1:B=B-1
1350 IF A1=102 OR A1=83 OR A1=65 OR A1=115 OR A1=246 THEN 3000
1360 IF A2=102 OR A2=83 OR A2=65 OR A2=115 OR A2=246 THEN 3000
1370 IF A3=102 OR A3=83 OR A3=65 OR A3=115 OR A3=246 THEN 3000
1380 IF A1=86 OR A2=86 OR A3=86 THEN 3000
1390 IF A1=60 OR A2=60 OR A3=60 THEN 3000
1400 PRINT"#####<====>#####<====>"
1410 PRINT"#####!"FU
1420 PRINT"#####!"AM
1430 PRINT"#####!"SC

```

```

1440 POKEE(INT(RND(0)*10)+1),86
1450 POKEE(INT(RND(0)*10)+1),32
1460 POKES9,32:POKES9+1,32
1500 Q=PEEK(151)
1510 IF Q=50 THEN SH=SH-40:GOSUB2100
1520 IF Q=18 THEN SH=SH+40:GOSUB2100
1530 IF Q=41 THEN SH=SH+2:GOSUB2100:B=B+2
1540 IF B=>22 THEN B=B-1:SH=SH-1
1550 IF Q=48 THEN PP=0:GOSUB2300
1560 IF Q=32 THEN PP=0:GOSUB2400

```

```

1600 FU=FU-5
1610 IF FUK<-5 THEN 3000
1999 SC=SC+1
2000 NEXTZX
2005 A$="":AA$=""
2006 K=K+1
2010 GOTO810

```

```

2100 POKES2,32:POKES2+1,32:POKES2+2,32:POKES2+3,32
2110 A1=PEEK(SH):A2=PEEK(SH+1):A3=PEEK(SH+2)
2210 POKESH,108:POKESH+1,111:POKESH+2,100

```

```

2220 RETURN
2300 IF AM<1 THEN RETURN
2301 AM=AM-1
2305 FOR Z=S2+4 TO S2+10
2310 IF PEEK(Z)=102 THEN PP=1:GOTO2390
2311 IF PEEK(Z)=83 THEN 2800
2312 IF PEEK(Z)=65 THEN 2900
2313 IF PEEK(Z)=115 THEN 4000
2314 IF PEEK(Z)=129 THEN 3300
2315 IF PEEK(Z)=134 THEN 3400
2316 IF PP=1 THEN 2390
2320 POKEZ,46:POKEP,140:POKEP,142
2330 POKER,46:POKEP,190:POKEP,200
2340 POKEP,0:POKEZ,32
2390 NEXTZ:RETURN
2400 AM=AM-1:IF AM<0 THEN RETURN

```

```

2410 Z=SH+3
2420 Z=Z+40
2421 IF PEEK(Z)=102 THEN 2500
2422 IF PEEK(Z)=83 THEN 2800
2423 IF PEEK(Z)=65 THEN 2900
2424 IF PEEK(Z)=115 THEN 4000
2425 IF PEEK(Z)=129 THEN 3300
2426 IF PEEK(Z)=134 THEN 3400
2430 POKEZ,81:POKEP,100
2435 FORZZ=1T04:POKEP,200:POKEP,180:POKEP,110:NEXTZZ

```




```

2440 POKEP,0:FORZZ=1TO20:NEXTZZ:POKEZ,32
2490 GOTO 2420
2500 RETURN
2700 POKES4,32:POKES4+1,32:POKES4+2,32:POKES4+3,32:POKES4+4,32
2710 S5=0:L=INT(RND(0)*3)
2720 S3=33164+(L*40)
2750 RETURN
2751 S8=0:L=INT(RND(0)*3)
2752 S6=33164+(L*40)
2753 POKES9,32:POKES9+1,32:POKES9+2,32:POKES9+3,32:POKES9+4,32
2755 RETURN
2800 FOR F=1 TO 25
2810 J=INT(RND(0)*4)
2820 POKEP,J*25:IF J=1 THEN POKEZ,86

```

```

2830 IF J=2 THEN POKEZ,214
2840 IF J=3 THEN POKEZ,32
2850 POKEP,J+20
2860 NEXTF:POKEP,0:SC=SC+1000:RETURN
2900 FOR X=1 TO 25
2910 J=INT(RND(0)*4)+1
2920 POKEP,J*10:IF J=1 THEN POKEZ,87
2930 IF J=2 THEN POKEZ,215
2940 IF J=3 THEN POKEZ,32
2950 POKEP,J*20+50:NEXTX:POKEP,0:SC=SC+500:RETURN
3000 POKES2+3,32
3005 FOR Z=1 TO 10
3010 POKEP,210:POKES2,32:POKES2+1,32:POKES2+2,160:POKEP,0
3015 POKEP,170:POKES2,32:POKES2+1,32:POKES2+2,102:POKEP,0
3020 POKEP,180:POKES2,32:POKES2+1,160:POKES2+2,32:POKEP,0
3025 POKEP,250:POKES2,32:POKES2+1,102:POKES2+2,32:POKEP,0
3030 POKEP,240:POKES2,160:POKES2+1,32:POKES2+2,32:POKEP,0
3035 POKEP,125:POKES2,102:POKES2+1,32:POKES2+2,32:POKEP,0

```

```

3040 NEXTZ
3050 POKES2,32:POKES2+1,32:POKES2+2,32
3100 FOR X=32768TO33767STEP4
3110 Z=PEEK(X)
3120 IF Z<128 THENZ=Z+128:GOTO3140
3130 IF Z>128 THENZ=Z-128
3140 POKEP,Z:NEXTX
3250 FORF=1TO800:NEXTF:PRINT"J"
3260 GOTO 4500
3300 FOR X=1 TO 50
3310 J=INT(RND(0)*4)
3320 IF J=1 THEN POKEZ,1:POKEP,210:POKEP,180
3330 IF J=3 THEN POKEZ,129:POKEP,170:POKEP,240
3340 NEXTX
3350 AM=AM+10
3390 RETURN
3400 FOR X=1 TO 50
3410 J=INT(RND(0)*4)
3420 IF J=1 THEN POKEZ,134:POKEP,150:POKEP,110
3430 IF J=3 THEN POKEZ,6:POKEP,110:POKEP,190

```

```

3440 NEXTX.
3450 FU=FU+100:RETURN
4000 FORX=1 TO 10
4005 POKEZ,INT(RND(0)*250):POKEZ+1,32
4010 J=INT(RND(0)*4)
4020 POKEP,J*20:IFJ=1THENPOKEZ-41,43
4030 IFJ=2THENPOKEZ-41,171
4040 IFJ=3THENPOKEZ-41,32
4060 POKEP,J*25:IFJ=1THENPOKEZ-39,43
4070 IFJ=2THENPOKEZ-39,171
4080 IFJ=3THENPOKEZ-39,32
4100 POKEP,J*15:IFJ=1THENPOKEZ+39,43

```




```

4110 IFJ=2THENPOKEZ+39,171
4120 IFJ=3THENPOKEZ+39,32
4140 POKEP,J*10:IFJ=1THENPOKEZ+41,43
4150 IFJ=2THENPOKEZ+41,171
4160 IFJ=3THENPOKEZ+41,32
4170 NEXTX:POKEP,0
4180 POKEZ-39,32:POKEZ-41,32:POKEZ+41,32:POKEZ+39,32:POKEZ,32
4190 S5=0:L=INT(RND(0)*3)
4200 S3=33164+(L*40):SC=SC+250
4210 RETURN
4500 REM ***** END *****
4501 GETN$:PRINT"Q"N$:IF N$<>" " THEN 4501
4510 PRINT"J"
4520 PRINT"!!!!!!!!!!!!!!!!!!!!!!GAME OVER"
4530 PRINT"!!!!!!!!!!!!!!!!!!!!!!"
4540 PRINT"!!!!!!!!!!!!!!!!!!!!!!YOU SCORED "SC
4550 FORX=1TO10:IFSC>S(X)THEN4570
4560 NEXTX:GOTO4700
4570 PRINT"!!!!!!!!!!!!!!!!!!!!!!PLEASE ENTER YOUR NAME FOR THE "
4580 PRINT"!!!!!!!!!!!!!!!!!!!!!!SCORE-TABLE."
4590 PRINT"Q"
4600 INPUTS$(X):S(X)=SC
4610 IF LEN(S$(X))>12 THEN 4570
4700 FOR F=1 TO 800:NEXTF:PRINT"J"
4710 PRINT"!!!!!!!!!!!!!!!!!!!!!!YOU JUST SCORED"SC
4720 PRINT"Q"
4730 FORX=1TO10
4740 PRINT"!!!!!!!!!!!!!!S(X)" S$(X)
4750 POKEP,X*20
4760 FOR Z=1 TO 80:NEXTZ
4800 NEXTX
4805 POKEP,0
4810 PRINT"!!!!!!!!!!!!!!!!!!!!!!PRESS RETURN>"
4820 IF PEEK(151)<>27 THEN 4820
4900 GOTO90
5000 END
6000 REM ***** START *****
6001 GETN$
6005 GOTO 7010
6010 RESTORE:PRINT"J":POKE59458,100
6015 PRINT"!!!!!!!!!!!!!!!!!!!!!!"
6020 READZ$:READZZ:POKEP,ZZ
6025 GETN$:IFN$<>" " THEN 7500
6030 IF Z$="+" THEN 6980
6050 PRINTZ$
6060 PRINT
6100 FOR X=1 TO 20:POKEP,ZZ:POKEP,ZZ+10:NEXTX
6110 FOR X=1 TO 10:POKEP,ZZ+10:POKEP,ZZ-10:NEXTX
6120 POKEP,0:FORX=1TO500:NEXTX
6200 GOTO 6020
6980 POKEP,0:POKE59458,30
6990 POKE59458,30
7000 GOTO6000
7010 PRINT"J":POKE59458,100:FORZ=1TO250:NEXTZ
7015 FOR X=1 TO 24
7017 GETN$:IFN$<>" " THEN 7500
7020 PRINTTAB(10)"S.O.S. MISSION J"
7030 FOR Z=1 TO 100 STEP11:POKEP,Z:NEXTZ:POKEP,0
7040 FOR Z=1 TO 40:NEXTZ
7050 PRINTTAB(10)" S.O.S. MISSIONJ"
7060 FOR Z=100 TO 1 STEP-11:POKEP,Z:NEXTZ:POKEP,0

```



```

7070 FOR Z=1 TO 40:NEXTZ
7100 PRINTTAB(11)" S.O.S. MISSION 7"
7110 FOR Z=10 TO 200 STEP-14:POKEP,Z:NEXTZ:POKEP,0
7120 FOR Z=1 TO 60:NEXTZ
7125 GETN$:IFN#<>" THEN 7500
7150 PRINTTAB(11)" S.O.S. MISSION 7"
7160 FOR Z=10 TO 200 STEP-14:POKEP,Z:NEXTZ:POKEP,0
7170 FOR Z=1 TO 40:NEXTZ
7180 PRINTTAB(10)" S.O.S. MISSION 7"
7190 FOR Z=100 TO 1 STEP-11:POKEP,Z:NEXTZ:POKEP,0
7200 FOR Z=1 TO 40:NEXTZ
7210 PRINTTAB(10)"S.O.S. MISSION 7"
7220 FOR Z=1 TO 100 STEP11:POKEP,Z:NEXTZ:POKEP,0
7230 FOR Z=1 TO 40:NEXTZ
7240 PRINTTAB(10)"
7300 NEXTX
7400 GOTO 6010
7500 POKE59458,30:PRINT"#####KPRESS SPACE>" :POKEP,0
7510 GET N$:IF N#<>" " THEN 7510
7520 PRINT"J":RETURN
9000 DATA" S.O.S. MISSION.",210
9010 DATA" ".190
9015 DATA" (C) BY NIGEL STUART 29:8:1982.",150
9020 DATA" ",170
9030 DATA" WELCOME CAPTAIN YOU ARE NOW PLACED",150
9040 DATA" IN CHARGE OF OUR LATEST SPACE-CRAFT.",180
9050 DATA" YOUR MISSION IS TO ENTER A TUNNEL",220
9060 DATA" ON AN ALIEN PLANET AND DISTROY",150
9090 DATA" AS MANY OF THERE UNDERGROUND",130
9100 DATA" BASES, AMO DUMPS AND FUEL DUMPS ",240
9110 DATA" AS YOU CAN BEFORE YOU RUN OUT OF FUEL.",240
9120 DATA" ",100
9130 DATA" YOU MAY GAIN EXTRA FUEL AND AMO BY",190
9140 DATA" BOMBING OR SHOOTING AMO AND FUEL DUMPS.",210
9150 DATA" THESE ARE SHOWN AS SA AND SF.",80
9160 DATA" ",50
9170 DATA" THE CONTROLS FOR THE SPACE-CRAFT",80
9180 DATA" ARE AS FOLLOWS :-",170
9190 DATA" ",200
9200 DATA" 8 TO MOVE UP.",230
9210 DATA" 2 TO MOVE DOWN.",210
9220 DATA" 6 TO MOVE FORWARD.",190
9230 DATA" ",170
9240 DATA" A TO FIRE FORWARD.",150
9250 DATA" Z TO DROP A BOMB.",110
9260 DATA" ",150
9270 DATA" -----",180
9280 DATA" POINTS AWARDED FOR HITTING ",200
9290 DATA" + = 500",90
9300 DATA" * = 1000",80
9310 DATA" +S = 250",90
9320 DATA" YOU CAN NOT HIT <X",80
9330 DATA" SA = 10 UNITS OF AMO",90
9340 DATA" SF = 100 UNITS OF FUEL",80
9350 DATA" -----",180
9360 DATA" ",150
9370 DATA" GOOD LUCK!! ",200
9380 DATA" YOU WILLNOT BE ABLE TO RETURN BECAUSE",190
9390 DATA" YOU WILL BE BLOWN UP.",210
9400 DATA" BUT TRY TO GET AS FAR AS YOU CAN.",220
9410 DATA" WE ARE COUNTING ON YOU.....",230
9420 DATA" ",240
9430 DATA" ",210
9440 DATA" ",180
9450 DATA" ",150
9460 DATA" ",110
9470 DATA" ",80
9480 DATA" ",50
9490 DATA" ",20
9500 DATA" ",245
9510 DATA" ",245
9520 DATA" ",245
9530 DATA" ",10
9999 DATA" +",0

```


COPY

```
1REM BY neil devlin SEPT1982
2P.#12;?#E1=0;?#8000=32;P.*****
3P." BY***** COPY***
4F.D=1T090;WAIT;N.
5P.#12;?#8000=32
6?#E1=0;P." ** COPY **
7?#E1=0;P."REPEAT WHAT THE COMPUTER FLASHES"
8?#E1=0;P."BY PRESSING NUMBERS 1 TO 4."
9IN,"" INPUT"" 1-FAST SLOW-2 "0
10IF (0<1)<(0>2)G.3
11IF 0=1 V=10;G.13
120=20
13DIMB847
14J=0;M=#B002
15 P.#21;DIM RR1,P-1;L=#FFE3
16C;RR0 JSR L;STA#0;RTS;J;P.#6
17F=0;G=0;E=0;I=0
18F.D=0T047
19A=A.R.#5;IFA=0 G.19
20BBD=A;N.
21CLEAR4
22GOS.C;COLOUR3
23GOS.50;F.D=1T020;WAIT;N.
24GOS.45
25E=E+1;B=0;C=0
26GOS.39
27IFF=G GOS.b;GOS.a;G=G+1;E=0;C=0;F=0;F.D=1T065;WAIT;N.;G.24
28F=F+1;C=0;G.24
29E.
30aLINK RR0
31IF(?#80>52)<(?#80<49) G.a
32IF?#80=49 I=I+1;J=1;X=10;COLOUR1
33IF?#80=50 I=I+1;J=2;X=40;COLOUR1
34IF?#80=51 I=I+1;J=3;X=70;COLOUR3
35IF?#80=52 I=I+1;J=4;X=100;COLOUR3
36B=0;C=0;GOS.39;IFBB(I-1)<X>J G.68
37IFE=I I=0;F=0;COLOUR0;GOS.58;R.
38G.a
39REM DRAW SQUARE
40F.D=1T03
41MOVE(X+B),75;WAIT;DRAW(X+B),80
```

```
42B=B+1;N.;IF C=1 GOS.55
43F.D=1T0 0;WAIT;N.
44IFC=0;COLOUR0;B=0;C=1;G.39;R.
45IF BBE=1 X=10;COLOUR1;R.
46IF BBE=2 X=40;COLOUR1;R.
47IF BBE=3 X=70;COLOUR3;R.
48IF BBE=4 X=100;COLOUR3;R.
49E.
50REM DRAW NUMBERS
51MOVE11,60;DRAW11,65
52MOVE42,60;DRAW39,60;DRAW39,62;DRAW42,62;DRAW42,64;DRAW39,64
53MOVE70,60;DRAW73,60;DRAW73,64;DRAW70,64;MOVE70,62;DRAW73,62
54MOVE103,62;DRAW100,62;DRAW100,64;MOVE102,63;DRAW102,60;R.
55P.#7;R.
56bREM DRAW 'YOUR GO'
57COLOUR1
58MOVE35,150;DRAW39,150;DRAW39,158;MOVE39,154;DRAW35,154
59DRAW35,158
60MOVE43,150;DRAW47,150;DRAW47,158;DRAW43,158;DRAW43,150
61MOVE51,158 ;DRAW51,150;DRAW55,150;DRAW55,158
62MOVE59,150;DRAW59,158;DRAW62,158 ;DRAW63,157;DRAW63,154
63MOVE63,154;DRAW59,154;MOVE61,154;DRAW63,150
64MOVE78,158;DRAW75,158;DRAW74,157;DRAW74,151;DRAW75,150
65DRAW77,150;DRAW78,151;DRAW78,153;DRAW77,153
66MOVE82,150;DRAW86,150;DRAW86,158;DRAW82,158;DRAW82,150
67R.
68P.#12;?#E1=0;?#8000=32
69P.***** TUT-TUT"" WRONG CHOICE"
70IN,"" ANOTHER GAME (1-NO YES-2)"Z
71IF Z=2 G.74
72P.#12;?#E1=0;?#8000=32;P.***** BYE-COWARD"
73G.73
74P.#12;?#E1=0;P.***** "O.K I'LL GIVE YOU ANOTHER CHANCE"
75?#8000=32;G.9
76cREM DRAW 'COPY'
77COLOUR3
78MOVE56,190;DRAW54,190;DRAW54,186;DRAW56,186
79MOVE58,190;DRAW58,186;DRAW60,186;DRAW60,190;DRAW58,190
80MOVE62,188;DRAW64,188;DRAW64,190;DRAW62,190;DRAW62,186
81MOVE66,190;DRAW66,188;DRAW68,188;MOVE68,190;DRAW68,186
82DRAW66,186;R.
```

How good are your powers of concentration and memory?

Not very good, then let Copy hone them to razor sharpness as the Atom displays in hi-res graphics an ever increasing sequence

of numbers for you to remember. One wrong one and you have to start all over again from scratch.

For those of you thinking you are superior there is a fast mode designed to take the smirk off your face and bring you back to reality.

Based upon the Simon game, Copy is written for an expanded Atom.

COPY

BY NEIL DEVLIN

RUNS ON AN ATOM IN 12K

```
10 GO SUB 620
15 REM MAIN LOOP
20 FOR g=1 TO 20
30 IF g>1 THEN PRINT AT 11,4:
PAPER 3; FLASH 1; " Made it! "g.
" ghosts now " : PAUSE 200: FOR J
=1 TO 5: BEEP .1,30: NEXT J: PAU
SE 200
40 LET m=0
50 GO SUB 520
55 REM SET UP ANTIMATTER
60 FOR j=1 TO 10
70 PRINT AT INT (RND*20)+1,INT
(RND*30)+1: INK 5; "●"
80 NEXT j
85 REM SET UP PLAYER & GHOSTS
90 LET a=INT (RND*21)+1
100 LET b=INT (RND*31)+1
110 DIM a(g,2): DIM b(g,2)
120 FOR j=1 TO g
130 LET a(j,1)=INT (RND*21)+1
140 LET a(j,2)=INT (RND*31)+1
150 NEXT j
160 LET c=a: LET d=b
170 GO SUB 420
180 PRINT AT 0,0: PAPER 2; " "
190 PAUSE 0
195 REM MOVEMENT LOOP
200 FOR k=1 TO 3
210 LET c=a
220 LET d=b
225 REM PLAYER MOVEMENT
230 LET a=a+(INKEY$="6" AND a<2
1)-(INKEY$="7" AND a>1)
240 LET b=b+(INKEY$="8" AND b<3
1)-(INKEY$="5" AND b>0)
245 REM GHOST MOVEMENT
```

GHOSTS

How long can you evade the nasty little ghosts that pursue relentlessly around the screen? Your only chance is to force the ghosts to step onto anti-matter spots.

First there will be one ghost after you and when he has been disposed of two more will appear to carry on the evil job. When the two have gone three will appear, then four, five . . .

Watch out that you do not get caught by them or step onto an anti-matter spot or you will come to a nasty end!

This program uses all three of the Spectrum's best requisites — sound, colour, and user-defined graphics — to make up an exciting arcade type game.

When run the computer sets up the screen and waits for you to press a key before starting. Your little man is moved by the cursor keys.

BY IAN McATAMNEY

RUNS ON A SPECTRUM IN 16K


```

450 FOR J=1 TO 9
460 IF a(J,1)=000 THEN NEXT J
470 IF J>9 THEN RETURN (a(J,2))
480 IF ATTR ((a(J,1)), (a(J,2)))
490 THEN LET a(J,1)=b(J,1): LET
a(J,2)=b(J,2)
490 PRINT AT (J,1), b(J,2):
AT a(J,1), a(J,2): INK 6:

```

[illegible]

BY MATTHEW BLAKSTAD

OV: other temporary variable. TN: direction of turn/correct input test. PP: position of poke (location). C1: left hand corner for facing wall. C2: right hand corner for facing wall. WH: wall height for facing wall. DW: wall depths for walls in adjacent cells.


```

134 PRINT"
135 PRINT"
136 PRINT"
137 PRINT"
138 PRINT"
139 PRINT"
140 PRINT"
141 PRINT"
142 PRINT"
143 PRINT"
144 PRINT"
145 PRINT"
146 PRINT"
147 PRINT"
148 PRINT"
149 PRINT"
150 TEMP07:FORJ=1T05:FORI=1T05:MUSIC"_D0_E0"
:NEXT:FORI=1T05:MUSIC"_D0_C0"
155 NEXTI,J
160 PRINT"□":PRINTS$:"Find your way"
161 PRINTS$:"through a"
162 PRINTS$:"perspective view"
163 PRINTS$:"□of one of three"
164 PRINTS$:"mazes,using the"
165 PRINTS$:"commands listed."
166 PRINT:PRINT:PRINTS$:"N.B. The cell"
167 PRINTS$:"nearest to you"
168 PRINTS$:"is the one"
169 PRINTS$:"which you are"
170 PRINTS$:"in."
180 PRINT:PRINT:PRINT:PRINTS$:"PRESS ANY KEY"
190 GET A$:IFA$=""THEN190
250 PRINT"§SELECT MAZE(1-3)"
260 GETA$:IF(VAL(A$)=0)+(VAL(A$)>3)THEN260
265 PRINT"§"
270 DIMMS(10,10):FORX=1TOVAL(A$):FORI=1TO10:
FORJ=1TO10:READMS(I,J):NEXTJ,I,X
280 MZ=VAL(A$)
290 POKE59555,0
295 TI$="000000"
299 REM == DISPLAY LOOP ==
300 TI=LI:TJ=LJ:FORCA=1TO4
309 REM == LEFT & RIGHT WALLS ==
310 FORSD=1TO2
320 OU=DR+(3-2*SD):IFOV=0THENOU=4
325 IFOV=5THENOU=1
330 TV=MS(TI,TJ)/DR(OU)
335 IFINT(TV)<>TVTHEN1050
340 FORI=CL(SD,CA)TOCL(SD,CA)+(43-2*SD)*(4-
CA)STEP(43-2*SD)
345 POKEI,DL(SD,1):NEXT
347 IFCA=4THENI=CL(SD,CA)+40:GOTO360
350 TV=I+(SD*2-3):FORI=TUTOTV+40*(DW(CA)-2*
(4-CA)-3)STEP40:POKEI,UL(SD):NEXT
360 TV=I:FORI=TUTOTV+(37+2*SD)*(4-CA)STEP
(37+2*SD):POKEI,DL(SD,2):NEXTI
370 FORI=CL(SD,CA)+(2*SD-3)TOCL(SD,CA)+
(2*SD-3)+40:DW(CA)-40STEP40
380 POKEI,UL(SD):NEXTI
381 NEXTSD
385 IFCA=4THEN450
390 TV=MS(TI,TJ)/DR(DR)
400 IFINT(TV)=TVTHEN1000
410 IFDR=1THENI=TI-1:IFTI=0THENPOKECL
(1,4),5:GOTO700
420 IFDR=2THENJ=TJ+1
430 IFDR=3THENI=TI+1
440 IFDR=4THENJ=TJ-1
450 NEXTCA
700 POKE59555,1:PRINT"□":S$:" Your move"
710 PRINTS$:"======"
720 PRINT:PRINT:PRINTS$:"L=Left R=Right"
730 PRINT:PRINTS$:"F=Flip M=Move"
740 PRINT:PRINT:PRINTS$:"§"
750 GETA$:IFA$=""THEN750
760 PRINT"□":S$:" "A$
770 IFA$="L"THENTN=1
780 IFA$="R"THENTN=-1
790 IFA$="F"THENTN=2
800 IFA$="M"THEN850
810 IFTN=0THEN750
820 DR=DR+TN:IFDR=0THENDR=4
830 IFDR=4THENDR=DR-4
840 TN=0:PRINT"§":POKE59555,0:GOTO300
850 IFMS(LI,LJ)/DR(DR)=INT(MS(LI,LJ)/DR(DR)
)THENMUSIC"C0":GOTO750
855 IFDR=1THENLI=LI-1:IFLI=0THEN900
860 IFDR=2THENLJ=LJ+1

```

```

870 IFDR=3THENLI=LJ+1
880 IFDR=4THENLJ=LJ-1
890 GOTO840
900 FORI=1TO200:POKE4514,INT(RND(1)*50):USR
(68):NEXT:USR(71)
910 PRINT"G";
920 ONMZGOSUB1180,1400,1620
930 PRINT"00000000";S$:"STARTING"
935 PRINTS$:"CO-ORDS :-"
940 PRINT:PRINTS$:"(<CI;" ,<CJ;" )"
945 PP=53207+80*CI+2*CJ
950 POKEPP,202
955 PRINT:PRINT:PRINTS$:"Time:-":VAL(MID$(
TI$,3,2)):" mins."
960 PRINT:PRINT:PRINTS$:"SSANOTHER GAME?"
965 GET A$:IF A$=""THEN965
970 IFA$="Y"THENPRINT"YES":FORI=1TO500:NEXT:
RESTORE:GOTO1
980 PRINT"NO":END
999 REM == FACING WALL DISPLAY ==
1000 C1=CL(1,CA)+(5-CA)*41:C2=CL(2,CA)+(5-CA)
*39:WH=DW(CA)-2*(5-CA)-1
1005 FORI=C1TOC2:POKEI-40,60:NEXTI
1010 FORI=0TOWH:POKEC1+40*I,VL(2):POKEC2+40*
I,VL(1):NEXT
1020 FORI=C1+40*WHTOC2+40*WH:POKEI+40,112:NEXT
1030 GOTO700
1049 REM == SPACE TO SIDE ==
1050 SI=TI:SJ=TJ
1060 IFOV=1THENSJ=SI-1:IFSI=0THEN381
1070 IFOV=2THENSJ=SJ+1
1080 IFOV=3THENSI=SI+1
1090 IFOV=4THENSJ=SJ-1
1100 TV=MS(SI,SJ)/DR(DR)
1110 IFINT(TV)>TVTHENGOTO381
-CA):CL=CL(SD,CA)+40*(4-CA):DM=3-2*SD
*(4-CA)STEPDM:POKEI,60:NEXTI
IFCA=4THEN1160
TU+40*(DW-1)STEP40:POKEI,VL(SD):NEXTI
TU+(-DM)*(4-CA)STEP-DM:POKEI,112:NEXT
##### " 1370 PRINT""
      "" " 1380 PRINT""
##### " 1390 RETURN
      "" "
      "" " 1400 PRINT""
      "" " 1410 PRINT""
      "" " 1420 PRINT""
      "" " 1430 PRINT""
      "" " 1440 PRINT""
      "" " 1450 PRINT""
      "" " 1460 PRINT""
      "" " 1470 PRINT""
      "" " 1480 PRINT""
      "" " 1490 PRINT""
      "" " 1500 PRINT""
      "" " 1510 PRINT""
      "" " 1520 PRINT""
##### " 1530 PRINT""
      "" " 1540 PRINT""
##### " 1550 PRINT""
      "" " 1560 PRINT""
##### " 1570 PRINT""
      "" " 1580 PRINT""
      "" " 1590 PRINT""
      "" " 1600 PRINT""
      "" " 1610 RETURN
      "" " 1620 PRINT""
      "" " 1630 PRINT""
      "" " 1640 PRINT""
      "" " 1650 PRINT""
      "" " 1660 PRINT""
      "" " 1670 PRINT""
      "" " 1680 PRINT""
      "" " 1690 PRINT""
##### " 1700 PRINT""
##### " 1710 PRINT""
##### " 1720 PRINT""
##### " 1730 PRINT""
##### " 1740 PRINT""
##### " 1750 PRINT""
##### " 1760 PRINT""
##### " 1770 PRINT""
##### " 1780 PRINT""
      "" " 1790 PRINT""
      "" " 1800 PRINT""
      "" " 1810 PRINT""
      "" " 1820 PRINT""
      "" " 1830 RETURN

```


GRAPHICAL

BY IAN TURTLE

RUNS ON A ZX81 IN 8K

GOLF

So you think you're another Arnold Palmer do you? Well, reduced at the end of the round.

this round of golf will sort the men out from the boys!

Graphical Golf is an 18-hole simulation of the real game. It has been made as realistic as possible, with many of the features of the real thing.

Initially, the computer asks you if you would like a random or a normal course.

If you choose the normal course, you will get the lengths and pars of holes stored in the REM statement in line 10.

If you choose the random course, you have access to over 65 000 different courses by inputting a number between 1 and 65 000+ in

reply to "COURSE NO?". If you want to play that course again sometime, simply input the same number in

response to "COURSE NO?". Finally, you asked to input your handicap, else input 24. If you play well enough, your handicap will be

From now, you are on the course. If you have a ZX81, you will see the computer draw the hole, else, on the ZX80, the screen will simply go blank for 10 seconds or so.

When the computer has finished, you will be presented with a graphical representation of a golf hole.

The computer will then ask you for your choice of club. You have 22 clubs, consisting of 1-4 woods, 1-9 irons and with their own percentage swing. Next you are asked to input an angle of shot. An input of 'O' degrees means straight ahead, '90' straight up, etc.

You'll encounter all the hazards of a real course, bunkers, the rough, and even water traps

The computer will print out a scorecard for each round you play - and maybe even reduce your handicap should your performance warrant it!

```

10 REM 36143894206350054084359
44244388419634004560513233574294
44755375418035505
20 LET V=VAL "1"
30 LET Y=VAL "0"
40 PRINT TAB VAL "9";"GRAPHICA
L GOLF"
50 PRINT
60 PRINT TAB VAL "7";"(C) IAN T
URTLE, 1981"
70 PRINT
80 PRINT "RANDOM OR NORMAL COU
RSE?-R/N"
90 PAUSE VAL "40000"
100 LET Z$=INKEY$
110 IF Z$<>"R" AND Z$<>"N" THEN
GOTO VAL "80"
120 DIM L(VAL "18")
130 DIM P(VAL "18")
140 DIM S(VAL "18")
150 IF Z$="R" THEN GOTO VAL "26
0"
160 LET ZZ=VAL "16513"
170 FOR H=V TO VAL "18"
180 FOR A=V TO VAL "3"
190 LET ZZ=ZZ+V
200 LET L(H)=L(H)*VAL "10"+PEEK
(ZZ)-VAL "28"
210 NEXT A
220 LET ZZ=ZZ+V
230 LET P(H)=PEEK (ZZ)-VAL "28"
240 NEXT H
250 GOTO VAL "330"
260 PRINT "COURSE NO?"
263 INPUT ZZ
266 RAND ZZ
267 LET ZZ=Y
270 FOR H=V TO VAL "18"
280 LET L(H)=INT (RND*VAL "420"
)+VAL "181"
290 LET P(H)=VAL "3"+(L(H)>VAL
"279")+(L(H)>VAL "499")
295 LET ZZ=ZZ+P(H)
300 NEXT H
305 PRINT "PAR=";ZZ
310 FOR A=V TO VAL "2"
320 NEXT A
330 LET A$=""
340 LET B$=""
350 FOR B=V TO VAL "32"
360 LET A$=A$+CHR$ VAL "8"
370 LET B$=B$+CHR$ Y
380 NEXT B
390 LET AS=Y
393 LET PB=Y
396 LET RC=Y
400 LET CI=Y
410 LET PS=Y
420 LET HP=Y
430 LET UP=Y
440 LET TS=Y
450 LET PR=Y
460 LET ZZ=Y
470 LET YY=Y
480 LET XX=Y
490 LET SH=Y
500 LET DF=Y
510 LET HS=Y
520 LET VS=Y
530 LET BP=Y
540 LET MC=Y
550 LET TG=Y
570 PRINT "HANDICAP?"
580 INPUT HA
585 RAND
590 CLS
595 LET DF=PEEK VAL "16396"+VAL
"256";*PEEK VAL "16397"
600 FOR H=V TO VAL "18"
610 LET PR=PR+P(H)
620 LET SH=Y
700 FOR A=V TO VAL "18"
710 PRINT A$
720 NEXT A
730 PRINT "HOLE ";H;" DIST ";L
(H);" PAR ";P(H)
740 LET UP=VAL "3"+INT (RND*VAL
"13")
745 LET TG=UP
750 FOR A=V TO L(H)/VAL "20"-V
760 FOR B=-V-(RND>.5) TO V+(RND
>.5)

```

```

770 POKE (UP+B)*VAL "33"+A+DF,Y
780 NEXT B
790 LET UP=UP+(RND>.5)-(RND>.5)
800 LET UP=UP-(UP>VAL "15")+(UP
<VAL "2")
810 NEXT A
820 LET HP=INT (L(H)/VAL "20")-
V
830 FOR A=-V-(RND>.3) TO V+(RND
>.3)
850 FOR B=-V-(RND>.3) TO V+(RND
>.3)
860 POKE (VA+B)*VAL "33"+HP+A+D
F,VAL "128"
870 NEXT B
880 NEXT A
890 POKE UP*VAL "33"+HP+DF,VAL
"149"
900 POKE DF+TG*VAL "33"+V,VAL "
185"
910 LET ZZ=VAL "-3"+INT (RND*VA
L "7")
920 LET YY=DF+(UP+ZZ)*VAL "33"+
HP
930 IF PEEK (YY)<>VAL "8" AND P
EEK (YY)<>Y THEN GOTO VAL "910"
940 POKE YY,VAL "52"
950 FOR A=V TO VAL "4"+(RND>.4)
960 LET ZZ=VAL "-3"-INT (RND*VA
L "3")
970 LET XX=VAL "-3"+INT (RND*VA
L "7")
980 LET YY=DF+(UP+XX)*VAL "33"+
HP+ZZ
990 IF PEEK (YY)<>VAL "8" AND P
EEK (YY)<>Y THEN GOTO VAL "960"
1000 POKE YY,VAL "52"
1010 NEXT A
1020 IF P(H)<VAL "4" THEN GOTO V
AL "1240"
1030 LET HP=VAL "10"

```



```

1040 FOR A=U TO VAL "4" + (RND*.4)
1050 LET ZZ=HP+INT (RND*VAL "4")
1060 FOR B=Y TO VAL "17"
1070 LET YY=DF+B*VAL "33"+ZZ
1080 IF PEEK (YY) <> Y THEN GOTO U
AL "1110"
1090 POKE YY, VAL "52"
1100 GOTO VAL "1120"
1110 NEXT B
1120 NEXT A
1130 IF P(H) < VAL "5" THEN GOTO U
AL "1240"
1140 LET HP=VAL "17"
1150 FOR A=U TO VAL "4" + (RND*.4)
1160 LET ZZ=HP+INT (RND*VAL "4")
1170 FOR B=Y TO VAL "17"
1180 LET YY=DF+B*VAL "33"+ZZ
1190 IF PEEK (YY) <> Y THEN GOTO U
AL "1220"
1200 POKE YY, VAL "52"
1210 GOTO VAL "1230"
1220 NEXT B
1230 NEXT A
1240 IF RND*.25 THEN GOTO VAL "1
310"
1250 LET HP=INT (L(H)/VAL "40")
1260 FOR A=Y TO VAL "17"
1270 POKE A*VAL "33"+HP+DF, VAL "
152"
1280 LET HP=HP+(RND*.5) - (RND*.5)
1290 LET HP=HP+(HP*VAL "2") - (HP)
=L(H)/VAL "20")
1300 NEXT A
1310 LET HP=U
1320 LET UP=TG
1330 LET PB=Y
1350 PRINT AT VAL "21", Y; "CLUB?"
1360 INPUT CI
1370 IF CI < U OR CI > VAL "29" OR C
I > VAL "4" AND CI < VAL "11" OR CI =
VAL "20" OR CI < MC THEN GOTO VAL
"1360"
1375 LET MC=Y
1380 IF CI > VAL "19" THEN GOTO VA
L "1410"
1390 LET PS=VAL "100"
1400 GOTO VAL "1450"
1410 PRINT AT VAL "21", Y; "PERCEN
TAGE SWING? (50-100)"
1430 INPUT PS
1440 IF PS < VAL "50" OR PS > VAL "1
00" THEN GOTO VAL "1430"
1450 PRINT AT VAL "21", Y; "SHOT A
NGLE? (-180 TO +180)"
1470 INPUT AS
1480 IF AS < VAL "-180" OR AS > VAL
"180" THEN GOTO VAL "1470"
1483 PRINT AT VAL "21", Y; B$
1484 PRINT AT VAL "20", Y; B$
1485 IF PB = V THEN POKE BP, YY
1490 LET AS=INT (AS+RND*(VAL "22
"+HA) - RND*(VAL "22"+HA))
1500 LET AS=(AS*PI)/VAL "180"
1510 LET SH=SH+U
1520 LET PS=PS/VAL "100"
1530 IF CI > VAL "20" THEN LET CI=
CI-VAL "10"
1533 IF CI > VAL "10" THEN LET CI=
CI-VAL "6"
1536 LET CI=VAL "16"-CI
1537 POKE DF+U, VAL "28"+SH
1540 LET HS=INT (((CI*(VAL "14
"+INT (RND*VAL "3")))*PS*RC)*COS
(AS))/VAL "20")+5)
1545 LET VS=INT (((CI*(VAL "14
"+INT (RND*VAL "3")))*PS*RC)*SIN
(AS))/VAL "20")+5)
1547 LET RC=U
1550 LET BP=DF+HP+HS+(UP+VS)*VAL
"33"
1560 IF HP+HS > VAL "32" OR HP+HS <
U OR UP+VS < Y OR UP+VS > VAL "17" T
HEN GOTO VAL "1670"
1580 LET YY=PEEK (BP)
1590 IF YY=VAL "152" THEN GOTO U
AL "1720"
1595 LET PB=Y
1600 FOR A=U TO VAL "3"
1602 POKE BP, YY
1603 PAUSE VAL "50"
1604 POKE BP, VAL "155"
1605 PAUSE VAL "50"
1606 NEXT A
1610 IF YY=VAL "128" OR YY=VAL "
149" THEN GOTO VAL "2000"
1620 IF YY=VAL "8" THEN GOTO VAL
"1750"

```

```

1630 IF YY=VAL "52" THEN GOTO VA
L "1830"
1640 PRINT AT VAL "20", Y; B$
1650 PRINT AT VAL "20", Y; "ON FRI
RUAY"
1660 GOTO VAL "1930"
1670 PRINT AT VAL "20", Y; B$
1680 PRINT AT VAL "20", Y; "OUT OF
BOUNDS-PENELTY 1 STROKE"
1690 LET SH=SH+U
1695 LET PB=Y
1700 PAUSE VAL "100"
1710 GOTO VAL "1340"
1720 PRINT AT VAL "20", Y; B$
1730 PRINT AT VAL "20", Y; "SPLASH
IN WATER-PEN. 1 STROKE"
1740 GOTO VAL "1690"
1750 PRINT AT VAL "20", Y; B$
1755 LET MC=VAL "11"
1760 IF RND*.4 THEN GOTO VAL "18
60"
1770 PRINT AT VAL "20", Y; "IN HEA
UY ROUGH"
1780 LET RC=.6+RND/VAL "5"
1790 GOTO VAL "1930"
1800 PRINT AT VAL "20", Y; "IN LIG
HT ROUGH"
1810 LET RC=.8+RND/VAL "5"
1820 GOTO VAL "1930"
1830 PRINT AT VAL "20", Y; B$
1840 PRINT AT VAL "20", Y; "BUNKER
ED-"
1850 LET ZZ=INT (RND*VAL "3")
1860 IF ZZ=U THEN PRINT "GOOD"
1870 IF ZZ=U THEN LET MC=VAL "24
"+INT (RND*VAL "2")
1880 IF ZZ=Y THEN PRINT "AV."
1890 IF ZZ=Y THEN LET MC=VAL "26
"+INT (RND*VAL "2")
1900 IF ZZ=VAL "2" THEN PRINT "B
AD"
1910 IF ZZ=VAL "2" THEN LET MC=U
AL "28"+INT (RND*VAL "2")
1915 LET RC=.7-ZZ/VAL "10"+RND/U
AL "5"
1920 PRINT " LIE, MAX. CLUB "; MC
1930 PAUSE VAL "100"
1940 LET HP=HP+HS
1950 LET UP=UP+VS
1960 GOTO VAL "1350"
2000 LET HP=HP+HS
2010 PRINT AT VAL "20", Y; B$
2020 PRINT AT VAL "20", Y; "ON THE
GREEN IN "; SH
2030 PAUSE VAL "150"
2040 CLS
2050 PRINT TAB VAL "17"; " "
2060 PRINT TAB VAL "17"; " "
2070 PRINT TAB VAL "17"; " "
2080 FOR A=U TO VAL "6"
2090 PRINT TAB VAL "20"; "I"
2130 NEXT A
2140 PRINT "
2150 POKE DF+VAL "52", VAL "128"+
VAL "29"*(INT (H/VAL "10")=U)
2160 POKE DF+VAL "53", VAL "156"+
H-(INT (H/VAL "10")*VAL "10")
2170 LET TG=VAL "2"+INT (RND*VAL
"3")
2180 IF TG=VAL "2" THEN PRINT "S
LOW"
2190 IF TG=VAL "3" THEN PRINT "M
EDIUM"
2200 IF TG=VAL "4" THEN PRINT "F
AST"
2210 PRINT " GREEN"
2220 PRINT AT VAL "12", VAL "3"; "
FT. FROM PIN"
2230 LET YY=ABS (HP+U-INT (L(H)/
VAL "20"))
2240 LET BP=INT (YY*VAL "20"+RND
*VAL "20")+U
2250 PRINT AT VAL "12", Y; " "
2260 PRINT AT VAL "12", Y; ABS BP
2270 IF ABS BP < VAL "2" THEN GOTO
VAL "2460"
2280 LET YY=VAL "20"-INT ((BP/VA
L "3")+U)
2290 IF YY > VAL "32" THEN LET YY=
VAL "32"
2300 IF YY < U THEN LET YY=U
2310 LET YY=YY-(YY=VAL "20")+ (YY
=VAL "21")
2320 POKE DF+VAL "297"+YY, VAL "5
2"
2330 PRINT AT VAL "13", Y; "PUTTIN

```


DODGEMS

RUNS ON A BBC MODEL B

Your BBC micro will set up a square-shaped race track for you — and two cars will appear. One red — and it's aim is extremely unfriendly. It wants to knock you off the road as quickly as possible. You must avoid the computer car.

IN 32K


```

580M=( (SGN(HM)<>0)-(SGN(VM)<>0))*2*((A=178)-(A=193))
590IF FNREADCH(YA%+VM*SGN(M),YD%+HM*SGN(M))<>"~" AND FNREADCH(YA%+VM*M,YD%+HM*
M)<>"~" THEN YA%=YA%+VM*M:YD%=YD%+HM*M:IF FNREADCH(YA%-VM*M/2,YD%-HM*M/2)=". "THE
NPRINTAB(YA%-VM*M/2,YD%-HM*M/2); " ":SC=SC+score:COLOUR$crcl:PRINTTAB(8,0);SC
600REM
610REM MOVE AROUND THE MAZE
620TY=YD%+VM:TX=YA%+HM:A$=FNREADCH(TX,TY)
630IFA$="." THEN SC=SC+score:COLOUR$crcl:PRINTTAB(8,0);SC
640IFA$<" " AND A$<" " PROCCHNG
650YD%=YD%+VM:YA%=YA%+HM:SOUND1,1,100,1
660COLOUR$yourcol:PRINTTAB(YA%,YD%)CAR$
670ENDPROC
680DEFPROCCHNG
690IFVM=1 AND HM=0 THENVM=0:HM=1:CAR$=CHR$250:ENDPROC
700IFVM=0 AND HM=1 THENVM=-1:HM=0:CAR$=CHR$251:ENDPROC
710IFVM=-1 AND HM=0 THENVM=0:HM=-1:CAR$=CHR$250:ENDPROC
720IFVM=0 AND HM=-1 THENVM=1:HM=0:CAR$=CHR$251:ENDPROC
730DEFNREADCH(X,Y)
740LOCALA$,LASTX,LASTY,C
750LASTX=POS:LASTY=VPOS
760VDU31,X,Y
770A$=135:C=USR(&FFF4) AND &FFFF
780C=C DIV &100
790VDU31,LASTX,LASTY
800=CHR$(C)
810DEFPROCMOVE2
820TX=MX+DX:TY=MY+DY
830A$=FNREADCH(TX,TY)
840IF A$="~" THEN PROCCHAN
850COLOUR$dotcol:PRINTTAB(OX,OY);"."
860COLOUR$mycol:PRINTTAB(TX,TY);CAR2$:SOUND1,-8,50,1
870OX=TX:OY=TY:PROCCHNGLANE
880ENDPROC
890DEFPROCCHAN
900IF MX=0 AND MY=1 THEN MX=-1:MY=0:CAR2$=CHR$250:GOTO940
910IF MX=-1 AND MY=0 THEN MX=0:MY=-1:CAR2$=CHR$251:GOTO940
920IF MX=0 AND MY=-1 THEN MX=1:MY=0:CAR2$=CHR$250:GOTO940
930IF MX=1 AND MY=0 THEN MX=0:MY=1:CAR2$=CHR$251:GOTO940
940TX=MX+DX:TY=MY+DY:ENDPROC
950DEFPROCCHNGLANE
960DI=RND(3)-2:IFDI=0THEN960
970A$=FNREADCH(OX+MY*DI,OY+MX*DI)
980IFA$="~" THENENDPROC
990A$=FNREADCH(OX+MY*DI*2,OY+MX*DI*2)
1000IFA$="~" THENENDPROC
1010COLOUR$dotcol:PRINTTAB(OX,OY);"."
1020OX=OX+MY*DI*2:OY=OY+MX*DI*2
1030COLOUR$mycol:PRINTTAB(OX,OY);CAR$:ENDPROC
1040REMHIT
1050VDU23,240,0,0,0,24,24,0,0,0
1060VDU23,241,0,0,60,36,36,60,0,0
1070VDU23,242,0,126,66,66,66,66,126,0
1080VDU23,243,255,129,129,129,129,129,129,255
1090X=OX:Y=OY
1100FORT=1T045
1110VDU5:GCOL0,endcol
1120MOVEX*64,1020-Y*32
1130IF T AND 1<>0 THENPRINTCHR$240:MOVEX*64,1020-Y*32
1140IF T AND 2<>0 THENPRINTCHR$241:MOVEX*64,1020-Y*32
1150IF T AND 4<>0 THENPRINTCHR$242:MOVEX*64,1020-Y*32
1160IF T AND 8<>0 THENPRINTCHR$243:MOVEX*64,1020-Y*32
1170VDU4:PRINTTAB(OX,OY); " ":SOUND1,1,255-T*255/45,1:NEXT
1180CLS: *FX15,0
1190MODE7:PRINTTAB(5,10);"You scored ";SC
1200IF high<SC THEN high=SC
1210PRINTTAB(5,11);"High Score: ";high
1220PRINT " Do you want another go?"
1230A$=GET$
1240IFA$="Y" THEN30
1250IFA$="N" THENCLS:END
1260PRINTTAB(5,13);"Just a simple Y or N is sufficient.":GOTO1230
1270DEFPROC FILLING
1280RESTORE1460:GCOL0,dotcol:VDU5
1290MOVE0,up
1300FORT=1T026:READA$:PRINT " ":A$:NEXT
1310VDU4:ENDPROC
1340DEFPROCINSTRUCT
1350PRINTTAB(13);CHR$141;"DODGEMS"
1360PRINTTAB(13);CHR$141;"DODGEMS"
1370PRINTTAB(14);"=====
1380PRINTTAB(3)"Welcome to the game of Dodgems."
1390PRINT" In this you have a picture of a square Race track. There are also two
cars The Red Car and The Green Car. The only control you have over yo
ur car (the green one) is that of either moving in to a smaller"
1400PRINT" track or out to a larger one. The red cargoes around the track in an o
pposite directions to you. To avoid it you must use these controls:"
1410PRINT " A-Move in."
1420PRINT " D-Move out."
1430PRINT " Happy Dogeming!!"
1440PRINT " Press space to start."
1450REPEAT A$=GET$:UNTIL A$=" ":ENDPROC

```

```

1460DATA.....
1470DATA.....
1480DATA.....
1490DATA.....
1500DATA.....
1510DATA.....
1520DATA.....
1530DATA.....
1531DATA.....
1532DATA.....
1533DATA.....
1540DATA.....
1550DATA.....
1560DATA.....
1570DATA.....
1571DATA.....
1580DATA.....
1590DATA.....
1600DATA.....
1610DATA.....
1620DATA.....
1630DATA.....
1640DATA.....
1650DATA.....
1660DATA.....
1670DATA.....

```

10000DEFPROCSETUP

```

10010up=959:REM Start position of dots
10020backcol=132:REM Background colour
10030forecol=6:REM Foreground colour
10040yourcol=2:REM Colour of controlled car
10050dotcol=3:REM Colour of dots
10060mycol=1:REM Colour of random car
10070scrcl=1:REM Colour of score
10080score=10:REM Increment of score
10090endcol=3:REM Colour of end graphics
10100ENDPROC

```


ALPHA

```

1000 GETA: IFA#=" " THEN 1060
1070 IFA#<" " THEN 1360
1080 PRINT "ALPHA ATTACK"
1090 PRINT "YOU ARE IN CONTROL OF THE SOLE REMAINING ALPHA BASE ON THE"
1100 PRINT "TERRAN PLANET 'EARTH'."
1110 PRINT "IT IS YOUR JOB TO PREVENT THE MARAUDING ASTROL BATTLE FLEET"
1120 PRINT "FROM INVADING THE PLANET."
1130 PRINT "BUT DUE TO PREVIOUS ATTACKS THE COMPUTER HAS MALFUNCTIONED."
1140 PRINT "PRESS ANY KEY"
1150 GETA: IFA#=" " THEN 1160
1160 PRINT "ALPHA ATTACK"
1170 PRINT "MFUNCTION THE BASE AND GUN TURRET MAY NO"
1180 PRINT "DUE TO THIS"
1190 PRINT "BE MOVED TOGETHER"
1200 PRINT "WHILST MOVING THE COMPUTER RELEASES";
1210 PRINT "CONTROL OF THE GUN TURRET"
1220 PRINT "PRESS ANY KEY"
1230 PRINT "PRESS ANY KEY"
1240 PRINT "PRESS ANY KEY"
1250 GETA: IFA#=" " THEN 1260
1260 PRINT "ALPHA ATTACK"
1270 PRINT "THE CONTROLS ARE:"
1280 PRINT "Z-MOVES BASE LEFT"
1290 PRINT "X-MOVES BASE RIGHT"
1300 PRINT "Q-MOVES TURRET LEFT"
1310 PRINT "W-MOVES TURRET RIGHT"
1320 PRINT "SPACE BAR FIRES"
1330 PRINT "PRESS ANY KEY"
1340 PRINT "PRESS ANY KEY"
1350 GETA: IFA#=" " THEN 1360
1360 PRINT "ALPHA ATTACK"
1370 PRINT "WHAT DIFFICULTY?"
1380 PRINT "WHAT DIFFICULT - 5:POOR"
1390 PRINT "DIFFICULT - 9:EASY"
1400 PRINT "LEVEL"
1410 PRINT "ORVAL(R#)>SORVAL(R#)< THEN PRINT "I"; GOTO 1420
1420 INPUT " "
1430 V=VAL(R#)*10
1440 PRINT "WHAT IS YOUR"
1450 PRINT "MARKSMANSHIP RATING"
1460 PRINT "R# IFA#=" "ORVAL(R#)>SORVAL(R#)< THEN PRINT "I"; GOTO 1470
1470 INPUT " "
1480 V=VAL(R#)*10
1490 PRINT "PRESS ANY KEY TO PLAY"
1500 GETA: IFA#=" " THEN 1510
1510 PRINT "YOU'VE BEEN BLOWN UP!"
1520 PRINT "SHIPS FIRST: GOTO 1530"
1530 PRINT "AND YOU DIDN'T HIT A THING"
1540 PRINT "TO PLAY AGAIN OR ANY"
1550 PRINT "PRESS ANY KEY"
1560 GETA: IFA#=" " THEN 1570
1570 PRINT "CONGRATULATIONS YOU SURVIVED"
1580 PRINT "AND YOU SHOT THEM ALL"
1590 GOTO 1530
1600 GOTO 1510

```

Your planet has been devastated by the marauding Astrol Fleet, the most warlike nation in the galaxy. Your defences are all but wiped out and the Astrol warrior-ships are closing in for the kill.

You are in control of the last Alpha defence base. But it is damaged and your laser is short of power.

But your turret does contain a multi-directional beam conveyor in working order — so you will be able to use your skill and judgement to destroy the descending Astrol Ships.

You can control the position of your Alfa base — but due to a computer malfunction you cannot move and fire your laser at the same time. The number of laser bolts which you have at your disposal is defined by a marksmanship rating which is input at the start of the game.

The future of your planet is in your hands. Can you stop the awful Astrols invading and laying waste to your home?

ATTACK

BY ALEX KEIRNAN

RUNS ON AN UNEXPANDED VIC-20

```

1060 GETA: IFA#=" " THEN 1060
1070 IFA#<" " THEN 1360
1080 PRINT "ALPHA ATTACK"
1090 PRINT "YOU ARE IN CONTROL OF THE SOLE REMAINING ALPHA BASE ON THE"
1100 PRINT "TERRAN PLANET 'EARTH'."
1110 PRINT "IT IS YOUR JOB TO PREVENT THE MARAUDING ASTROL BATTLE FLEET"
1120 PRINT "FROM INVADING THE PLANET."
1130 PRINT "BUT DUE TO PREVIOUS ATTACKS THE COMPUTER HAS MALFUNCTIONED."
1140 PRINT "PRESS ANY KEY"
1150 GETA: IFA#=" " THEN 1160
1160 PRINT "ALPHA ATTACK"
1170 PRINT "MFUNCTION THE BASE AND GUN TURRET MAY NO"
1180 PRINT "DUE TO THIS"
1190 PRINT "BE MOVED TOGETHER"
1200 PRINT "WHILST MOVING THE COMPUTER RELEASES";
1210 PRINT "CONTROL OF THE GUN TURRET"
1220 PRINT "PRESS ANY KEY"
1230 PRINT "PRESS ANY KEY"
1240 PRINT "PRESS ANY KEY"
1250 GETA: IFA#=" " THEN 1260
1260 PRINT "ALPHA ATTACK"
1270 PRINT "THE CONTROLS ARE:"
1280 PRINT "Z-MOVES BASE LEFT"
1290 PRINT "X-MOVES BASE RIGHT"
1300 PRINT "Q-MOVES TURRET LEFT"
1310 PRINT "W-MOVES TURRET RIGHT"
1320 PRINT "SPACE BAR FIRES"
1330 PRINT "PRESS ANY KEY"
1340 PRINT "PRESS ANY KEY"
1350 GETA: IFA#=" " THEN 1360
1360 PRINT "ALPHA ATTACK"
1370 PRINT "WHAT DIFFICULTY?"
1380 PRINT "WHAT DIFFICULT - 5:POOR"
1390 PRINT "DIFFICULT - 9:EASY"
1400 PRINT "LEVEL"
1410 PRINT "ORVAL(R#)>SORVAL(R#)< THEN PRINT "I"; GOTO 1420
1420 INPUT " "
1430 V=VAL(R#)*10
1440 PRINT "WHAT IS YOUR"
1450 PRINT "MARKSMANSHIP RATING"
1460 PRINT "R# IFA#=" "ORVAL(R#)>SORVAL(R#)< THEN PRINT "I"; GOTO 1470
1470 INPUT " "
1480 V=VAL(R#)*10
1490 PRINT "PRESS ANY KEY TO PLAY"
1500 GETA: IFA#=" " THEN 1510
1510 PRINT "YOU'VE BEEN BLOWN UP!"
1520 PRINT "SHIPS FIRST: GOTO 1530"
1530 PRINT "AND YOU DIDN'T HIT A THING"
1540 PRINT "TO PLAY AGAIN OR ANY"
1550 PRINT "PRESS ANY KEY"
1560 GETA: IFA#=" " THEN 1570
1570 PRINT "CONGRATULATIONS YOU SURVIVED"
1580 PRINT "AND YOU SHOT THEM ALL"
1590 GOTO 1530
1600 GOTO 1510

```


PACMAN

BY NEIL FORSYTH

RUNS ON AN APPLE IN 48K

Munch your way around a maze in this adaptation of the game that has inspired pop-records, tee-shirts, pinball machines, TV adverts and thousands of imitators. It's all here. The ghosts out to munch the greedy little pacman. The power pills which enable the Pacman to devour the ghosts. And all the devious twists and turns of the maze itself.

There's an indicator at the bottom of the screen which tells you when the ghosts are vulnerable to attack. To help the Pacman the maze has two sneaky escape exits at either side which could help you baffle those deadly ghosts.

To control your Pacman use keys 'I' for up, 'J'-left, 'K'-right, 'M'-down. Just one warning - don't play this game between meals, it could ruin your appetite!

```

0 S = 0:L = 3: GOSUB 3000: DIM VA(14,11)
1 HOME : NORMAL
5 GOSUB 6000: GOSUB 10000
10 FOR Y = 0 TO 11
15 FOR X = 0 TO 14
20 READ A:VA(X,Y) = A
22 IF S > 2230 AND A / 13 = INT (A / 13) THEN A = (A / 13) * SGN
   (S - 4470):VA(X,Y) = A:NE = 1
25 NEXT X
27 NEXT Y
28 IF S > 0 THEN VA(0,5) = 0:VA(1,5) = 30:VA(14,5) = 0:VA(13,5) =
70:TB = 1
30 GOSUB 5000: ROT= 0: XDRAW 3 AT 129,145: XDRAW 2 AT 139,145: XDR
AW 3 AT 149,145
32 ROT= 0: SCALE= 1: FOR P = 1 TO L: XDRAW 2 AT P * 10 + 119,10: N
EXT P
35 V = 10:DI = 0:D = - 1:A = 139:OA = A:B = 64:OB = B: ROT= 0: XDR
AW 3 AT OA,OB
40 X = 139:Y = 114:R = 0
45 OX = X:OY = Y:RO = R: ROT= RO: XDRAW 2 AT OX,OY
47 HOME : IF NE = 1 THEN INVERSE : VTAB (21): PRINT " NO TUNN
EL AND NO ENERGIZERS ": NORMAL : GOTO 50
48 HOME : IF TB = 1 THEN INVERSE : VTAB (21): PRINT " THE TU
NNEL IS BLOCKED ": NORMAL
50 VTAB (22): FLASH : PRINT " HIT ANY KEY TO START
": POKE - 16368,0: WAIT - 16384,128: NORMAL
60 HOME : VTAB (21): PRINT " SCORE="
100 FOR T = 1 TO 2 STEP 0
110 K = PEEK ( - 16384)
120 XA = (OX - 69) / 10:YA = (OY - 24) / 10:PA = VA(XA,YA)
125 IF K = 201 THEN R = 0: IF PA / 2 = INT (PA / 2) THEN Y = Y -
V
130 IF K = 205 THEN R = 32: IF PA / 5 = INT (PA / 5) THEN Y = Y +
V
135 IF K = 202 THEN R = 48: IF PA / 7 = INT (PA / 7) THEN X = X -
V: IF X < 69 THEN X = 209
140 IF K = 203 THEN R = 16: IF PA / 3 = INT (PA / 3) THEN X = X +
V: IF X > 209 THEN X = 69
142 XA = (X - 69) / 10:YA = (Y - 24) / 10:PA = VA(XA,YA)
145 ROT= RO: XDRAW 2 AT OX,OY: ROT= R: XDRAW 2 AT X,Y
146 OX = X:OY = Y:RO = R
147 IF (A = X) * (B = Y) * (SF = 0) THEN GOTO 1000
150 IF PA > 0 AND PA / 13 < > INT (PA / 13) THEN ROT= 0: XDRAW

```




```

1 AT X,Y: POKE 768,96: POKE 769,3: CALL 770:VA(XA,YA) = - PA:DT
= DT - 1:S = S + 10: VTAB (21): HTAB (20): PRINT S: IF DT = 0 THEN
GOTO 2000
152 IF SF = 1 THEN ROT= 0: RETURN
155 IF PA > 0 AND PA / 13 = INT (PA / 13) THEN ROT= 0: XDRAW 4 A
T X,Y: FOR P = 10 TO 1 STEP - 1: POKE 768,P: POKE 769,3: CALL 77
0: NEXT P:VA(XA,YA) = - PA: GOSUB 600
200 GH = VA((OA - 69) / 10,(OB - 24) / 10)
205 D = - D:DI = 0
207 IF (Y = B) THEN GOTO 215
210 IF D < 0 OR (X = A) THEN GOTO 255
215 IF (X > A) THEN GOTO 240
220 IF GH / 7 = INT (GH / 7) THEN A = A - V: GOTO 320
230 GOTO 250
240 IF GH / 3 = INT (GH / 3) THEN A = A + V: GOTO 320
250 DI = DI + 1:D = - 1: IF DI = 2 THEN GOTO 285
255 IF Y > B THEN GOTO 270
260 IF GH / 2 = INT (GH / 2) THEN B = B - V: GOTO 320
265 GOTO 275
270 IF GH / 5 = INT (GH / 5) THEN B = B + V: GOTO 320
275 DI = DI + 1:D = 1: IF DI = 2 THEN GOTO 285
280 GOTO 215
285 IF (X - A) * SGN (X - A) > (Y - B) * SGN (Y - B) THEN GOTO
300
290 IF GH / 7 = INT (GH / 7) THEN A = A - V:D = 1: GOTO 320
295 A = A + V:D = 1: GOTO 320
300 IF GH / 2 = INT (GH / 2) THEN B = B - V:D = - 1: GOTO 320
305 B = B + V:D = - 1
320 IF A > 209 THEN A = 69
323 IF A < 69 THEN A = 209
325 ROT= 0: XDRAW 3 AT OA,OB: XDRAW 3 AT A,B: IF (A = X) * (B = Y)
THEN GOTO 1000
330 OA = A:OB = B
400 NEXT T
600 SF = 1: ROT= 0: XDRAW 3 AT 129,145: XDRAW 2 AT 139,145: XDRAW 3
AT 149,145: XDRAW 2 AT 129,145: XDRAW 3 AT 139,145: XDRAW 2 AT 1
49,145
610 FOR Z = 1 TO 15
620 GOSUB 110: IF (X = A) * (Y = B) THEN GOSUB 800: GOTO 700
630 P = INT ( RND (1) * 3)
635 GH = VA((OA - 69) / 10,(OB - 24) / 10)
640 IF P = 2 AND GH / 5 = INT (GH / 5) THEN B = B + V
650 IF P = 0 AND GH / 2 = INT (GH / 2) THEN B = B - V
660 IF P = 3 AND GH / 7 = INT (GH / 7) THEN A = A - V: IF A < 69
THEN A = 209
670 IF P = 1 AND GH / 3 = INT (GH / 3) THEN A = A + V: IF A > 209
THEN A = 69
680 ROT= 0: XDRAW 3 AT OA,OB: XDRAW 3 AT A,B:OA = A:OB = B
690 IF (X = A) * (Y = B) THEN GOSUB 800
700 NEXT Z
710 SF = 0: ROT= 0: XDRAW 2 AT 129,145: XDRAW 3 AT 139,145: XDRAW 2
AT 149,145: XDRAW 3 AT 129,145: XDRAW 2 AT 139,145: XDRAW 3 AT 1
49,145
715 FOR P = 1 TO 15:Z = PEEK ( - 16336): NEXT P
720 RETURN
800 XDRAW 3 AT A,B:A = 139:B = 64:OA = A:OB = B: FOR P = 1 TO 5: P
RINT CHR$ (7): NEXT P:Z = 15: XDRAW 3 AT OA,OB:S = S + 100: VTA
B (21): HTAB (20): PRINT S: RETURN
1000 ROT= R: XDRAW 2 AT X,Y: SCALE= 2: FOR R = 0 TO 128 STEP 8: RO
T= R: XDRAW 2 AT X,Y:D = PEEK ( - 16336): NEXT R: POKE - 16368,
0: HOME : VTAB (21): HTAB (15): PRINT "SCORE = ":S
1005 XDRAW 2 AT X,Y: ROT= 0: SCALE= 1: XDRAW 3 AT A,B: XDRAW 2 AT

```



```

L * 10 + 119,10:L = L - 1: IF L > 0 THEN 35
1010 PRINT "DO YOU WANT ANOTHER GAME? ";: FOR P = 1 TO 500: NEXT P
: POKE - 16368,0: GET Q$: IF Q$ = "Y" THEN CLEAR : DIM VA(14,11
):L = 3: GOTO 1
1020 TEXT : HOME : END
1100 REM *****
2000 HOME : VTAB (22): FLASH : PRINT "PERFECT SCORE. WELL DONE
      ": FOR P = 1 TO 15: POKE 768,16 - P: POKE 769,6: CALL
770: NEXT P: RESTORE : IF SF = 1 THEN POP
2005 SF = 0: GOTO 1
3000 TEXT : HOME
3010 PRINT "*****";
3020 PRINT "*";: FLASH : PRINT "
      ";; NORMAL : PRINT "*";
3025 PRINT "*";: FLASH : PRINT "
      ";; NORMAL : PRINT "*";
3030 PRINT "*****";
3040 PRINT : PRINT "SINCE THE GAME IS WELL KNOWN HERE ARE SIMPLE
      INSTRUCTIONS"
3050 PRINT
3060 PRINT " KEY ACTION"
3070 PRINT " ---"
3080 PRINT " I UP"
3090 PRINT " J LEFT"
3100 PRINT " K RIGHT"
3110 PRINT " M DOWN"
3120 PRINT " OTHER KEYS STOP"
3130 PRINT : PRINT " LARGE DOTS ARE ENERGIZERS."
3140 PRINT : PRINT " GHOST VULNERABILITY IS INDICATED AT THE SCREE
N BOTTOM BY TWO PACMEN WITH GHOST IN THE MIDDLE."
3150 PRINT : PRINT : FLASH : PRINT "HIT ANY KEY FOR SCREEN SET UP
      ";; NORMAL : GET ZZ$: RETURN.
5000 HGR
5002 FOR Y = 0 TO 11
5005 FOR X = 0 TO 14
5010 A = VA(X,Y)
5015 K = 69 + X * 10:V = 24 + Y * 10
5020 HCOLOR= 7
5050 IF A / 2 < > INT (A / 2) THEN HPLOT K - 5,V - 5 TO K + 5,V
- 5
5055 IF A / 3 < > INT (A / 3) THEN HPLOT K + 5,V - 5 TO K + 5,V
+ 5
5060 IF A / 5 < > INT (A / 5) THEN HPLOT K - 5,V + 5 TO K + 5,V
+ 5
5065 IF A / 7 < > INT (A / 7) THEN HPLOT K - 5,V - 5 TO K - 5,V
+ 5
5067 IF A > 0 AND A / 13 = INT (A / 13) THEN XDRAW 4 AT K,V: GOT
O 5400
5070 IF A > 0 THEN XDRAW 1 AT K,V:DT = DT + 1
5400 NEXT X
5410 NEXT Y
5420 HPLOT 0,0 TO 64,19: HPLOT 279,0 TO 214,19: HPLOT 0,159 TO 64,
139: HPLOT 279,159 TO 214,139
5500 RETURN
6000 FOR X = 770 TO 792
6010 READ Y
6020 POKE X,Y
6030 NEXT X
6040 DATA 173,48,192,136,208,5,206,1,3,240,9,202,208,245,174,0,
3,76,2,3,96,0,0
6050 RETURN
10000 HGR2 : POKE 232,16: POKE 233,64

```



```

10005 TEXT
10010 SCALE= 1: ROT= 0
10020 FOR X = 16400 TO 16460
10030 READ Y
10040 POKE X,Y
10050 NEXT X
10055 RETURN
10060 DATA 4,0,10,0,16,0,31,0,51,0
10070 DATA 42,36,63,54,21,0
10080 DATA 18,27,39,36,44,44,9,49,53,54,62,62,63,39,0
10090 DATA 46,30,46,9,36,39,37,39,39,63,46,62,35,23,46,21,63,54,6,
0
10100 DATA 53,30,60,60,12,37,21,21,6,0
20000 DATA 15,21,105,21,105,21,35,0,15,21,105,21,105,21,35
20010 DATA 10,15,42,35,6,35,30,273,70,15,14,15,42,35,10
20030 DATA 30,910,0,30,21,210,70,0,30,210,21,70,0,390,70
20040 DATA 10,6,105,14,15,14,30,21,70,6,35,6,105,14,10
20050 DATA 6,35,30,21,210,21,-210,-21,-210,21,210,21,70,15,14
20060 DATA -21,210,210,21,210,21,-70,0,-30,21,210,21,210,210,-21
20070 DATA 15,14,30,35,6,35,-6,-105,-14,15,14,15,70,6,35
20080 DATA 30,105,14,30,21,210,105,42,105,210,21,70,6,105,70
20090 DATA 10,30,21,70,15,14,30,105,70,6,35,30,21,70,10
20100 DATA 30,70,0,30,14,195,14,-10,6,455,6,70,0,30,70
20110 DATA 10,6,105,14,15,14,15,42,35,6,35,6,105,14,10
20120 DATA 6,21,42,21,42,21,14,0,6,21,42,21,42,21,14

```

VICTORIAN SEWERS

Chaos in the city as the ancient sewers start to collapse. Can you rebuild them before the city slips into a giant hole in the ground?

Your job is to keep the traffic flowing around the city's gradually eroding road system.

This program is in TI Basic for a 99/4A console with no additions. It will also run in Extended Basic, and if you have the 32K expansion memory, it will run faster in Extended Basic than in TI basic.

This program uses several tricks you may find useful: The play board is set up with PRINT statements - the fastest way of doing this. The characters (the UNDERLINE is used here) are defined.)

Note the use of POS in lines 1660 and 690 - the neatest way of reacting to a CALL KEY input. If the key pressed does not appear in the first string then the pro-

gram will goto/gosub the first line transfer, as the POS function will return nil.

Although TI Basic does not support AND and OR, these ARE used in this program, in lines 980 (* used for AND) and in line 1270 (+ used for OR) - also several other lines. Note the expressions are placed in brackets in these lines.

For greater speed the routines you plan are stored in a two dimensional array RT(N,M) which is read back to delete a route which suffers from a road collapse.

Conversion: Pretty easy. The screen is composed of 24 rows of 32 characters. The PRINT lines start in column 3, and as they all start with a space, the first PRINTED is in column 4.

CALL HCHAR is in the format: CALL HCHAR (ROW, COLUMN, ASCII, No of times)

CALL GCHAR is in the for-

mat: CALL GCHAR (ROW, COLUMN, VARIABLE) in which the variable takes the ASCII code of the character at that position.

The characters take the codes given in lines 2290-2340 and are all coloured blocks except the player (PLY) who is an 'R'.

Owners of machines with memory mapped screen

should recognise the formula in lines (1870 (encryption) and 1400-1410 (decoding) - this program does not look at column 32 so a slight approximation has been used.

For machines without the POS function, you will need to test the key pressed and GOTO/GOSUB as appropriate.

```

30 REM
31 REM SETTING UP THE BOARD
32 REM USE UNDERLINE: _
33 REM -----
100 DEF V1=RND*10
110 DEF V2=RND*12
120 DEF F1=RND*290+110
130 DEF F2=RND*290+110
140 DEF TM=RND*500+300
150 DIM RT(2,70)
160 DEF FR=RND*100+400
170 S=30000
180 GOSUB 1930
190 CALL CLEAR
200 PRINT
210 PRINT " -----
"
220 PRINT " - - - - -
"
230 PRINT " - - - - -
"

```

BY STEPHEN SHAW

RUNS ON A TEXAS TI 99/4a

IN 4K


```

240 PRINT " - - - -
- -
250 PRINT " -----
- -
260 PRINT " - - - -
- -
270 PRINT " - - - -
- -
280 PRINT " -
- -
290 PRINT " - - - -
- -
300 PRINT " -----
- -
310 PRINT " -----
- -
320 PRINT " - - - -
- -
330 PRINT " -
- -
340 PRINT " - - - -
- -
350 PRINT " - - - -
- -
360 PRINT " -----
- -
370 PRINT " - - - -
- -
380 PRINT " - -
- -
390 PRINT " - - - -
- -
400 PRINT " -----
- -
410 PRINT
420 PRINT
430 CALL HCHAR(11,1,UTR,32)
440 CALL HCHAR(12,1,LTR,32)
450 REM ROAD MAP DRAWN
460 CALL COLOR(1,4,4)
470 CALL HCHAR(11,13,HOLE,6)
480 CALL HCHAR(12,13,HOLE,6)
490 CALL HCHAR(11,4,RD,9)
500 CALL HCHAR(12,4,RD,9)
510 CALL HCHAR(11,19,RD,9)
520 CALL HCHAR(12,19,RD,9)
530 A=1
540 ROW=11
550 COL=4
560 GOSUB 1520
570 A=2
580 ROW=12
590 COL=4
600 GOSUB 1520
610 CALL GCHAR(11,9,CDE)
620 REM CONTROL SECTION
630 CALL KEY(0,K,ST)
640 IF RND<.99 THEN 660
650 CALL SOUND(TM,F1,V1,F2,V2)

```

```

660 CALL HCHAR(RR,RC,PLY)
670 CALL HCHAR(RR,RC,CDE)
680 IF ST<1 THEN 630
690 ON PDS("ESDXR",CHR$(K),1)+1
GOSUB 720,730,790,850,910,980
700 GOSUB 1190
710 GOTO 630
720 RETURN
730 CALL GCHAR(RR-1,RC,CD)
740 IF CD=32 THEN 780
750 RR=RR-1
760 CALL HCHAR(RR,RC,PLY)
770 CDE=CD
780 RETURN
790 CALL GCHAR(RR,RC-1,CD)
800 IF CD=32 THEN 780
810 RC=RC-1
820 CALL HCHAR(RR,RC,PLY)
830 CDE=CD
840 RETURN
850 CALL GCHAR(RR,RC+1,CD)
860 IF CD=32 THEN 840
870 RC=RC+1
880 CALL HCHAR(RR,RC,PLY)
890 CDE=CD
900 RETURN
910 CALL GCHAR(RR+1,RC,CD)
920 IF CD=32 THEN 900
930 RR=RR+1
940 CALL HCHAR(RR,RC,PLY)
950 CDE=CD
960 RETURN
970 REM REPAIR SECTION
980 IF (CDE<>HOLE)*(CDE<>REP) THEN
N 1040
990 IF CDE=HOLE THEN 1000 ELSE
1050
1000 CDE=REP
1010 FOR T=1 TO 10
1020 CALL SOUND(-199,S,30,S,30,F
R,30,-4,0)
1030 NEXT T
1040 RETURN
1050 IF CDE=REP THEN 1060 ELSE
1040
1060 CDE=RD
1070 IF (RR=11)+(RR=12) THEN 1080
ELSE 1040
1080 CALL HCHAR(RR,RC,CDE)
1090 FOR R=11 TO 12
1100 FOR C=3 TO 29
1110 CALL GCHAR(R,C,TEST)
1120 IF (TEST<>PLY)*(TEST<>RD)*(
TEST<>UTR)*(TEST<>LTR) THEN 1170
1130 NEXT C
1140 NEXT R
1150 REM WINNER***
1160 GOTO 2430
1170 RETURN
1180 REM DAMAGE

```



```

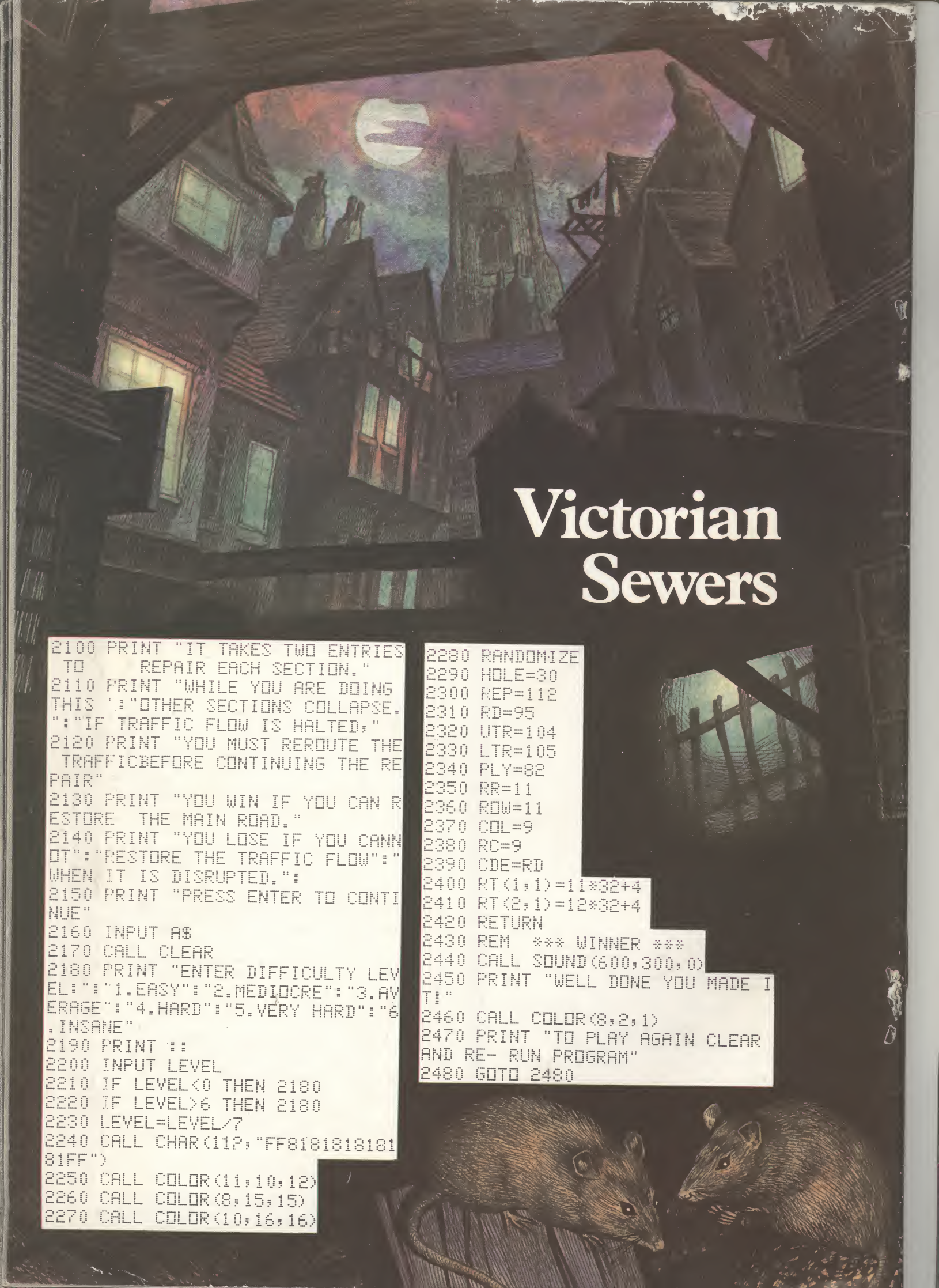
1190 C=INT(RND*22)+5
1200 R=INT(RND*20)+2
1210 CALL GCHAR(R,C,CD)
1220 IF (RR=R)*(RC=C) THEN 720
1230 IF (CD<>RD)*(CD<>UTR)*(CD<>
LTR) THEN 720
1240 IF RND>LEVEL THEN 720
1250 CALL HCHAR(R,C,HOLE)
1260 CALL SOUND(400,-8,0)
1270 IF (CD=UTR)+(CD=LTR) THEN 12
90
1280 RETURN
1290 FOR T2=1 TO 4
1300 FOR T=1 TO 5
1310 CALL SOUND(-99,500+T*20,T*4
)
1320 NEXT T
1330 CALL SOUND(-99,250,12,266,1
0)
1340 NEXT T2
1350 IF CD=LTR THEN 1380
1360 A=1
1370 GOTO 1390
1380 A=2
1390 FOR T=1 TO NUMB(A)
1400 ROW=INT(RT(A,T)/32)
1410 COL=(RT(A,T)/32-ROW)*32
1420 CALL GCHAR(ROW,COL,CD)
1430 IF (CD<>LTR)*(CD<>UTR) THEN
1450
1440 CALL HCHAR(ROW,COL,RD)
1450 NEXT T
1460 ROW=INT(RT(A,1)/32)
1470 COL=(RT(A,1)/32-ROW)*32
1480 CALL HCHAR(ROW,COL,PLY)
1490 GOSUB 1520
1500 RETURN
1510 REM ROUTE TRAFFIC
1520 NUMB(A)=0
1530 IF A=1 THEN 1570
1540 IF A<>2 THEN 1580
1550 TR=LTR
1560 GOTO 1580
1570 TR=UTR
1580 GOTO 1870
1590 CALL KEY(0,K,ST)
1600 CALL HCHAR(ROW,COL,PLY)
1610 CALL HCHAR(ROW,COL,TR)
1620 IF RND<.99 THEN 1640
1630 CALL SOUND(TM,F1,V1,F2,V2)
1640 IF ST<1 THEN 1590
1650 CALL SOUND(100,110,4)
1660 ON POS("ESDX",CHR$(K),1)+1
GOTO 1590,1670,1720,1820,1770
1670 CALL GCHAR(ROW-1,COL,CD)
1680 IF CD<>RD THEN 1590
1690 ROW=ROW-1
1700 CALL HCHAR(ROW,COL,TR)
1710 GOTO 1870
1720 CALL GCHAR(ROW,COL-1,CD)

```

```


1730 IF CD<>RD THEN 1590
1740 COL=COL-1
1750 CALL HCHAR(ROW,COL,TR)
1760 GOTO 1870
1770 CALL GCHAR(ROW+1,COL,CD)
1780 IF CD<>RD THEN 1590
1790 ROW=ROW+1
1800 CALL HCHAR(ROW,COL,TR)
1810 GOTO 1870
1820 CALL GCHAR(ROW,COL+1,CD)
1830 IF CD<>RD THEN 1590
1840 COL=COL+1
1850 CALL HCHAR(ROW,COL,TR)
1860 GOTO 1870
1870 TOT=ROW*32+COL
1880 NUMB(A)=NUMB(A)+1
1890 RT(A,NUMB(A))=TOT
1900 IF (ROW=10+A)*(COL=27) THEN
1920
1910 GOTO 1590
1920 RETURN
1930 CALL CLEAR
1940 PRINT "VICTORIAN SEWERS":;"
(C)1982 STEPHEN SHAW":;
1950 PRINT "YOU MUST KEEP THE CI
TY":;"TRAFFIC FLOWING.":;"DESPITE
THE FREQUENT",
1960 PRINT "COLLAPSE OF SECTIONS
OF ROADS AS THE OLD SEWERS AT LAS
T GIVE IN TO TIME."
1970 PRINT ::;"PRESS ENTER TO CO
NTINUE..."
1980 INPUT A$
1990 CALL CLEAR
2000 PRINT "A MAIN ROUTE RUNS AC
ROSS THE CENTRE OF THE SCREEN.":;
"A LARGE COLLAPSE TAKES PLACE"
2010 PRINT "FIRST YOU MUST REROU
TE EACH OF TWO LANES OF TRAFFIC"
:;"USING THE ARROW KEYS:":;" E.S
.D.& X."
2020 PRINT "YOUR ROUTE MUST NOT
CROSS ANY OTHER ROUTE NOR ANY"
:;"DAMAGED SECTIONS."
2030 PRINT "PLAN YOUR ROUTE BEFO
RE YOU BEGIN AS CORRECTIONS CAN
NOT BE MADE...":;
2040 PRINT "PRESS ENTER TO CONTI
NUE..."
2050 INPUT A$
2060 CALL CLEAR
2070 PRINT "WHEN TWO LANES OF TR
AFFIC HAVE BEEN ROUTED YOU ENT
ER ANOTHER SECTION OF PLAY."
2080 PRINT "YOU MUST MOVE YOUR R
EPAIR GANG (R) USING THE CURSO
R KEYS AND WHEN OVER DAMAGED
"
2090 PRINT "ROAD, REPAIR IT BY PR
ESSING KEY 'R'."

```





Victorian Sewers

```
2100 PRINT "IT TAKES TWO ENTRIES  
TO REPAIR EACH SECTION."  
2110 PRINT "WHILE YOU ARE DOING  
THIS 'OTHER SECTIONS COLLAPSE."  
": "IF TRAFFIC FLOW IS HALTED,"  
2120 PRINT "YOU MUST REROUTE THE  
TRAFFIC BEFORE CONTINUING THE RE  
PAIR"  
2130 PRINT "YOU WIN IF YOU CAN R  
ESTORE THE MAIN ROAD."  
2140 PRINT "YOU LOSE IF YOU CANN  
OT": "RESTORE THE TRAFFIC FLOW": "  
WHEN IT IS DISRUPTED.": "  
2150 PRINT "PRESS ENTER TO CONTI  
NUE"  
2160 INPUT A$  
2170 CALL CLEAR  
2180 PRINT "ENTER DIFFICULTY LEV  
EL": "1.EASY": "2.MEDIOCRE": "3.AV  
ERAGE": "4.HARD": "5.VERY HARD": "6  
.INSANE"  
2190 PRINT ::  
2200 INPUT LEVEL  
2210 IF LEVEL<0 THEN 2180  
2220 IF LEVEL>6 THEN 2180  
2230 LEVEL=LEVEL/7  
2240 CALL CHAR(112,"FF8181818181  
81FF")  
2250 CALL COLOR(11,10,12)  
2260 CALL COLOR(8,15,15)  
2270 CALL COLOR(10,16,16)
```



```
2280 RANDOMIZE  
2290 HOLE=30  
2300 REP=112  
2310 RD=95  
2320 UTR=104  
2330 LTR=105  
2340 PLY=82  
2350 RR=11  
2360 ROW=11  
2370 COL=9  
2380 RC=9  
2390 CDE=RD  
2400 RT(1,1)=11*32+4  
2410 RT(2,1)=12*32+4  
2420 RETURN  
2430 REM *** WINNER ***  
2440 CALL SOUND(600,300,0)  
2450 PRINT "WELL DONE YOU MADE I  
T!"  
2460 CALL COLOR(8,2,1)  
2470 PRINT "TO PLAY AGAIN CLEAR  
AND RE- RUN PROGRAM"  
2480 GOTO 2480
```



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Can you land your Spectrum? Or evolve up from amoeba into a human being? Or tackle the Castle of Riddles for £1,500 worth of prizes?

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Take up your lance and mount your ostrich in Joust, the latest flight of arcade fantasy. Plus new 3D thrills from Sub-roc 3D.

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Hope for a happy landing as you head for the airstrip in a giant Jumbo jet. You'll have to stay Sharp to survive

GOLF 38

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Out in the bush something stirs. It's big and extremely mean. Our only advice to Atom gamers is to run as fast as you can!

KRAZY KONG 72

Grrrrr! That big gorilla has kidnapped the girl of my dreams and I'm going to get her back. Just let me get my hands on my Pet and the rescue will be on ... If you enjoyed the last screens of Donkey Kong in the arcades you'll love the action in our own special version.



ESCAPE FROM THE PYRAMIDS OF MARS 48

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TANKER 53

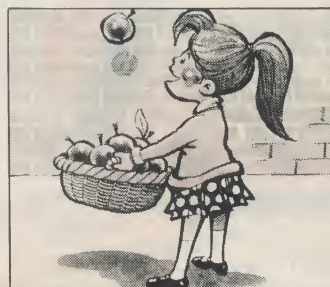
Action on the high seas for all of you seafaring Spectrum types.

OVER THE ORCHARD WALL 56

Here's a bit of fruity fun for Atari scrumpers. Our Arthur has nipped over the wall in search of apples and he wants your help

FRUIT MACHINE 62

All the fun of those "one-armed bandits" and it won't cost you a penny — except for the price of this magazine. Gambling without profit or loss for Vic owners.



Sci-fi rapping

Communicating with aliens is not always as easy as: "Me Elliott, you E.T." David Langford challenges you not to alienate the aliens as they swarm into the atmosphere above you uncertain whether to make friends or attack.

We take you through the sci-fi precedents and offer a listing on page 24.

Befriend an alien today. Star Wars only had one empire, we've got seven and inter-space conflict is breaking out on page 86. This unique competition/game will be running for many months to come, with a new winner every issue. It may be too late for you to take part in February but there's nothing to stop you joining in Seventh Empire for March.

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Editor Terry Pratt, Staff Writer Eugene Lacey, Editorial/Publishing Asst. Susan Cameron, Designer Linda Freeman, Production editor Tim Metcalfe,

Advertisement manager Rita Lewis, Advertising executives Neil Wood, John Phillips, Louise Matthews Advertisement assistant Louise Flockhart, Publisher Tom Moloney

Editorial and advertisement offices: Durrant House, 8 Herbal Hill, London EC1R 5JB; Telephone Editorial 01-278 6556, Advertising 01-278 6552

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Cover: Stuart Briers. Next issue: February 16th.



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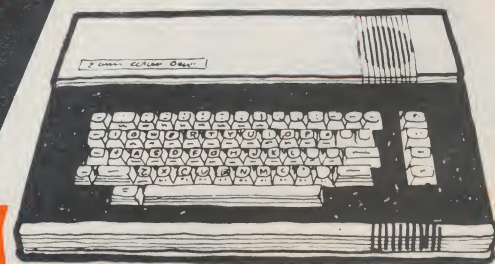
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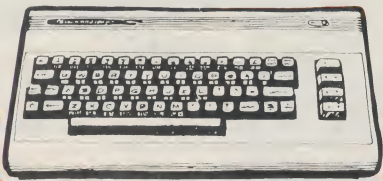
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I enclose cheque/postal order for £.....

NEXT MONTH!

Our next issue boasts a free giveaway guide to all kinds of computer games, who supplies them and how they compare.

We have sections on adventure games, chess, draughts, othello and backgammon games, arcade maze games, space attack games, novelty games and many more.

There's expert advice on how to choose the particular type of game you are interested in, what you should be looking for and what standards to expect.

WHAT'S BUGGIN' YOU?



Not getting a regular copy of *Computer & Video Games* eh! How do you expect your micro to work proper if you aren't reading the magazine every issue? And you with a nice little computer like that too.

Of course, I can't promise that if you had a regular copy of *C&VG* on order, your rampack would mysteriously stop wobbling overnight... but who can tell eh...

Just fill in the coupon (below) or I'll let you see your sister again.

Know what I mean?

To my newsagent: Please deliver/ reserve me a copy of *Computer and Video Games* every month. Price 75p.

Name

Address

Hot-on-the-heels of the Book of Games comes our Book of Reviews in the March issue.

For those of you unfamiliar with particular games, we have devoted a page to explaining the differences between Donkey Kong and Frogger, how to recognise a Galaxian when you see one and how to tell whether a Pacman ghost is edible or not.

Each cassette or disc reviewed is marked in our usual three categories, Getting Started, Value and Playability and if it scores three 10s you know our judges have been suitably impressed.

It all adds up to the most striking work yet on games software and it's free inside every copy of *Computer & Video Games*.

All you Seventh Empire competitors will need our March issue to check on your new position in the Seventh Empire game.

You might have proved to be the best fleet commander in the galaxy and earned yourself a Colour Genie on the way.

But even if you work out your score to be well behind the leaders, keep your fleets on the move in March there's still plenty of time to catch up.

Among our top games for March will be: a version of Donkey Kong — featuring Mario the carpenter and an escaped gorilla; Digger will ask you to dig a hole and trap a rampaging alien; there's Skiing, Rockfall and Dr Who Adventure.



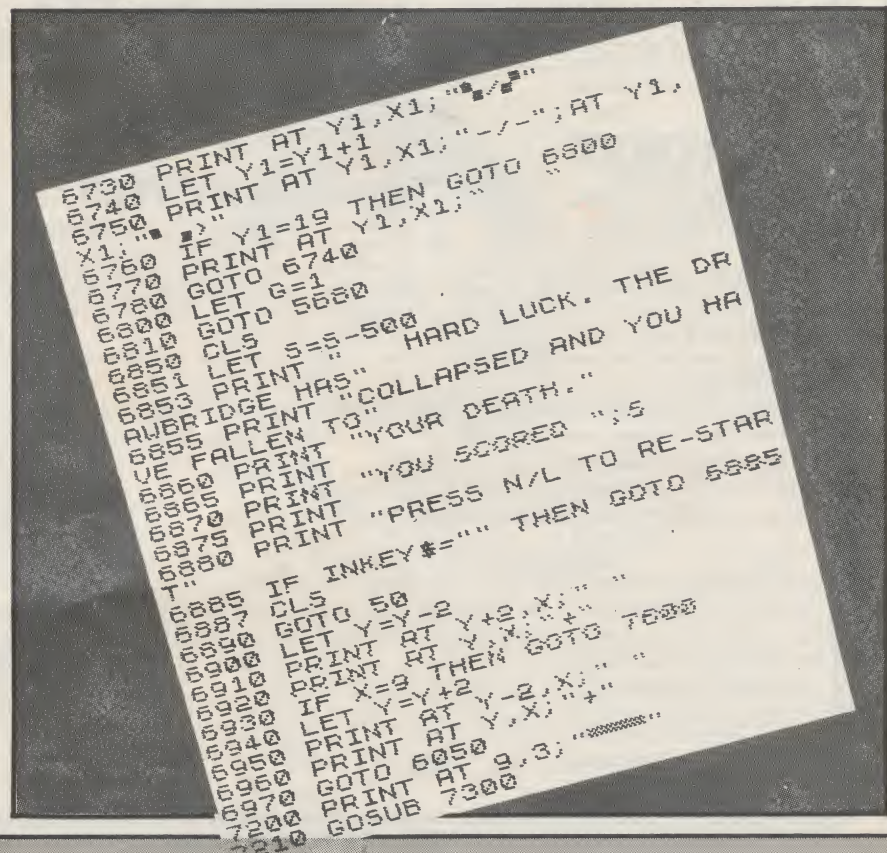
Confessions of a Bug

So you think it's easy being a Bug huh? Well you should try sneaking a dodgy listing past the *Computer & Video Games* testers.

The month of January tho', we didn't do too bad. Mal Function managed to pull a whole host of lines out of the ZX81 game Curse of the Aztec Tomb (shown below).

On Cave Flight most of you managed to spot the two arrow errors. In line 2040 the arrow should point left. In line 2515 the arrow should point right.

Dragon problems are fixed by:
250 IF INKEY\$="" THEN 250
150 CLSO: CLEAR 200: FOR I=0 TO 448 STEP 32: PRINT @ I, CHR\$(245);: PRINT @ I+31, CHR\$(250): NEXT I: PRINT @ 0, STRING\$(32,255);
330 FOR I=65 TO 161 STEP 32: PRINT @ I, STRING\$(30,(143+(I-1)/2));: NEXT I: RETURN



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6 COMPUTER & VIDEO GAMES



Please drop us a line at: Computer and Video Games, EMAP, Durrant House, 8 Herbal Hill, London EC1R 5JB.

SPECTRUM OUTBURST

Dear Sir,
I really must reply to Mr McAuley's extraordinary outburst on the Sinclair Spectrum.

The fault record of previous Sinclair machines was truly deplorable. A number of my friends and colleagues have had them. All have had problems and one tells me that the ZX81 he bought in April this year has been back to Sinclair four times so far. It has been in his hands for only seven weeks so far.

The Spectrum may be better; so few have been cleared so far that we cannot judge.

Sinclair machines are presumably meant for entertainment only. The Basic used is both limiting and limited with a consequent effect on possible programs.

Judging by the reaction of my nine-year-old son, who has used a friend's Spectrum, it is outgrown within three months. £215 for a three month toy is expensive by my standards.

Most adults are prevailed upon to buy a micro with two distinct arguments: (a) to assist in the education of their children.

(b) to use themselves for serious work.

What serious work could be done on a Spectrum? A payroll — for maybe twenty employees? Stock control for perhaps fifty item lives and five movements each per week? Word processing is out, without CP/M compatibility.

As for his penultimate paragraph, is he really telling us that Sinclair computers compete with the likes of IBM, Canon, Burroughs etc? Indeed, Sinclair manufactured calculators in the past, and micros now, but I was not aware that Sinclair make or have ever made computers?

"ITV is the best in the world!" I have live in Germany, France, Italy, Canada, Australia and the USA. With the exception of much native USA product, all these countries produce first class TV programmes.

If I had only £300 to spend I don't think I'd buy either any Sinclair product or the Beeb.

I think I'd go for the Genie II — a much underrated machine. As it is, I spent rather more on a 64K machine nearly a year ago, with not the faintest sniff of a breakdown so far. Good for games, and with CP/M, equally so for business.

Lastly, "Methinks, thou dost protest too much" Mr McAuley!
R. H. Hill,
Woodford Green,
Essex.

BBC IS THE BEST, OK?

Dear Sir,
I have just read Alan McAuley's letter in your December issue with disbelief. Has he actually used a BBC Micro? I doubt it very much.

For all those Spectrum owners, who, mistakenly, think the Spectrum is "better" than the BBC Micro: just look at the facts.

Spectrum good points:
Syntax check on entry, cheap price.

Spectrum bad points: Slow BASIC (3-5 times slower than the BBC Micro).

Poor quality sound (the BBC Micro has four sound channels with full ADSR control). High resolution graphics poor. Keyboards extremely difficult to type fast on (BBC Micro has a very good keyboard). Keyboard system a waste of time: up to six key presses needed for some functions! (Anyway, most BBC Basic commands can be abbreviated).

Note that I haven't

mentioned the BBC Micro's built-in assembler, the flexible Mode system for choosing screen format, the superb extended Microsoft Basic or the brilliant software available: just look closely at the Acornsoft range.

I hope this letter has finally shown to all those Spectrum owners that the BBC Micro is the best home computer in the world.

Richard K. Lloyd,
Wirral,
Merseyside.

ICE VENDOR VINDICATED!

Dear Sir,
With reference to *Computer and Video Games* issue number 13 — November 1982. I am writing to complain about the Pet/Apple program, Ice Cream Vendor. Line 10 reads:

```
VTAB 10: PRINT TAB (10)
"*****"
```

I was putting the program in our Pet computer at school when after the 19 we listed the program and a syntax



error appeared in line 10.

We tried deleting the "v" in it and that didn't work then we tried a space between the "v" and the "tab" but that still didn't work.

After about 10 minutes of puzzling it out we decided on deleting the "v" and the "tab" and Bingo! it worked!

Andrew Gardner,
Shanklin,
Isle of Wight.

ALIEN CHASE AMENDMENTS

Dear Sir,
Many thanks for the excellent standard of games in your magazine. I haven't typed in a bad one yet!

However, the December issue BBC game Alien Chase could give those of us with issue 1 (etc) operating systems some trouble.

In order to retain the features of the game, 2 changes need to be made:
50 VDU 23;10,32;0;0;
110 IF INKEY(-99) THEN
I%=226 ELSE IF
INKEY(+122) THEN I%=249
ELSE IF INKEY(-26) THEN
I%=153

This does the trick and the game proceeds as designed. I have also written an amendment for joysticks:
110 IF (ADVAL(0)AND3)=1
I%=226 ELSE IF
ADVAL(1)<21000 I%=249
ELSE IF ADVAL(1)>44000
I%=153

Dave Carlos,
Garforth,
Leeds.

TANDY AND THE DRAGON

Dear Sir,
Please could you tell me if the Tandy TRS-80 machines uses the same machine code as the Dragon 32 and if you can use Tandy games on it? If there are any other computers that use the same machine code could you tell me about them.

John De Silva,
Guildford,
Surrey.

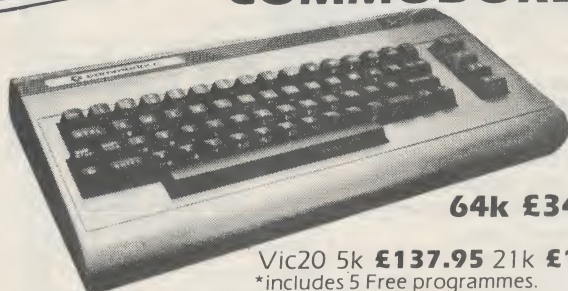
Editor's reply: The Dragon is based on the Tandy Colour Computer — not the TRS-80. It is therefore impossible to take the latter's machine code, which is for the Z80 microprocessor, and use it on the Colour Computer/Dragon 32, which has the 680S processor.



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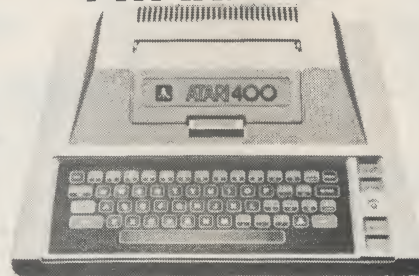
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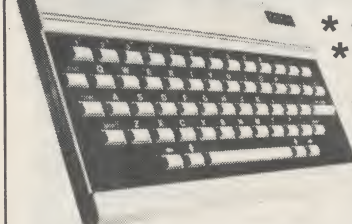
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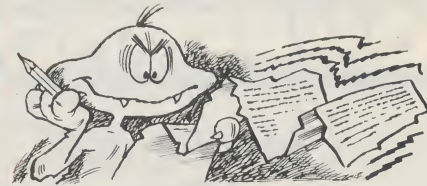
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MAILBAG



SEARCH FOR SOFTWARE

Dear Sir,
Having bought a Dragon 32 micro-computer I have found that up to now there has been a lack of available software for it.

I have heard, however, that because it uses microsoft basic it is possible to use software from the Tandy Colour Computer and the BBC computer. Is this correct?

And will you be featuring the programs for the Dragon in the near future? Keep up the excellent (art) work!!

*Simon Malpas,
Keyworth,
Nottinghamshire.*

Editor's reply: It is possible to enter listings for programs designed for the Tandy Colour Computer with very little modification.

Although all the more popular computers claim to use Microsoft Basic, there are so many different versions that it is very difficult to translate Pet to Apple to TRS-80 to Colour Computer/Dragon 32.

The BBC does not use Microsoft Basic it uses a peculiar and unique Basic that is supposed to be compatible with Microsoft. This is rather a tenuous claim for some of the commands!!

THE DREADED DISC QUIZ

Dear Sir,
As a video games enthusiast and the proud owner of an Intellivision games console, I was delighted to find your magazine at my local newsagent and have taken it regularly ever since.

Although I do not own a micro at present and so cannot run the programs listed each month, I do get immense enjoyment from reading all the other features, i.e. Mailbag, Games News, Arcade Action and so on.

However, having said that, I have heard that Mattel do plan to launch an add-on keyboard about March of

this year so there are some programming possibilities.

My main reason for writing to you is to try to find out what other people think of the Mattel system and in particular the "dreaded disc", their alternative to either joysticks or paddles as favoured by Atari, etc.

Although I find the disc reasonably easy to manage myself, most of my friends seem to disagree. Perhaps if this aversion could be got through to Mattel they may seriously consider bringing out some alternative form of control.

Finally, here is a list of my current high scores: Space Armada 500,320; Astrosmash 1,125,760; Lock'n'Chase 136,980; Space Hawk 253,890.

I would be most interested to learn if anyone can beat these or of any other high scores on Mattel games.

*Marc Duffield,
Huddersfield,
Yorks.*



THE BUGS ARE OUT!

Dear Sir,
One night after I had fallen asleep over my Sinclair Spectrum I was suddenly woken by cries of "Stamp on him", "Shove a club in his mouth!" Quick as a flash, I jumped up grabbed my camera and managed to get a photo of this amazing attack before they all disappeared inside my copy of *Computer and Video Games*!

Please print the photograph otherwise no-one will ever believe me.

*J. Carroll,
Rishton,
Lancashire.*

BACK TO THE MANUAL . . .

Dear Sir,
Please would you explain how to introduce variables into a defined function from the main body of a program for BBC Basic.

*Neeraj Sharma,
Slough,
Berkshire.*

Editor's reply: This is quite complex Basic programming I suggest you look at page 230 in the BBC manual.

GETTING THE CONNECTION

Dear Sir,
We have a BBC Model B at our school. We also have two printers, an Epson dot matrix printer MX80 F/T and an MX80 F/T type II which we use with our Research Machines 380Z.

I have some programs for

the BBC which I require hard copies of, and as we do not yet have a BBC printer I was wondering whether either of the printers are compatible.

Could you also advise me on the best Space Invader type games for the BBC?

*Martin Noakes,
Sittingbourne,
Kent.*

Editor's reply: If you have a Model B computer then the Epson printers — with RS232C interfaces — should work OK; however, the socket at the rear of the BBC computer — 5-way PIN — is non-standard for RS232C. So a special cable is required. (See page 406 of manual). Centronics parallel standard is available

through the parallel printer post. It all depends on your printers which standard you use.

Both of the following companies produce good Invader-type programs.
Bridge Software, 36 Fernwood, Marple Bridge, Stockport. Amba Software, 13 Cherry Bounds Road, Gorton, Cambridge CB3 0JT.

JOIN UP FOR ADVENTURE

Dear Sir,
A postal BBC Micro Adventure/Fantasy Club has now been formed. The club will provide a central library of Adventure and Fantasy games written by the members for the use of other members.

In this way Adventurers can find a ready group of fellow enthusiasts to share their fantastic journeys. Send an s.a.e. for further details.
BBC Micro Adventure Club, 29 Blackthorne Drive, Larkfield, Kent, ME20 6NR.

MYSTERIES OF THE SCROLL

Dear Sir,
Recently I have been trying to get my Vic to print random dots on the screen at random, then scroll the screen from right to left, while still printing dots at random. My attempts have been fruitless.

Please could you tell me the solution before I go mad with frustration!

*J. Skelding,
Stourbridge,
West Midlands.*

Editor's reply: It is easy, using the Poke instruction to get random dots on the screen. For example, using the information on pages 143/144 of the Vic instruction manual.

$10 \times = \text{INT}(\text{RND}(1) \times 506 + 1)$
20 POKE 7680 + \times , 42
30 GOTO 10

This will produce a random pattern of stars. I suggest you read the appropriate section of the *Vic Revealed*, by Nick Hampshire for ideas on how to scroll from left to right — it's far too complicated to explain in this small space.

Solving our earth invading puzzle

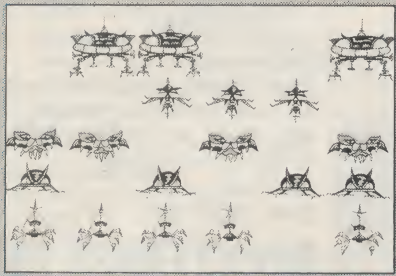
Saving the Earth from the alien hordes was the problem we set you last month and the more spirited defenders amongst you replied swiftly enough to keep our atmosphere free for eons to come.

The best solution Trevor Truran could manage was 21 shots to clear the atmosphere, or just two missed shots.

His best effort began at F and went on: A, E, B, E, C, C, D, B, F, B, C, C, F, C, A, D, A, C, D, F.

We will be publishing the winning names next month.

And Trevor's back with another Puzzling column in March.



A GOOD HOME FOR A DRAGON

The Sorcerer's Stone has captured a Dragon for its creator.

Andy Burras of Lindle Lane, Hutton, Preston in Lancashire, is the worthy winner of the Fantasy Game Competition we set in our November issue.

He wins a Dragon 32 micro-computer on which to pursue his thirst for fantasy games. And he is also being invited down by Mitre Wargames, which judged the competition entries, to discuss putting Sorcerer's Stone into operation as a new computer moderated game format to be played commercially.

Mark Blundell, of Mitre Wargames was impressed by the high standard of entries and offers his commiserations to the unlucky entrants, but felt that Sorcerer's Stone came closest to a workable computer moderated game format. "The author had put a lot of thought into how the game could be put onto a computer," said Mark.

Sorcerer's Stone is a game for

It's the turn of space pirate Austin Cambridge to hold forth on our special C&VG computer moderated game of Starweb, which is now drawing to a close. Austin's views on the galaxies of Starweb are reported faithfully by Anthony Shepherd, below.

PIRATE WITH A HEART OF GOLD

I'm the brighter buccaneer, the Simon Templar of the Space lanes, the man in the white space helmet. I may be a Pirate King but I am a **Good Guy**. I seek out and eliminate the outposts of my arch enemies, the oppressive Berserkers.

One of these, Gzinti, has been a thorn in my flesh with his absurd threats and impudence.

Another, a former ally of mine, threatened me recently so I sent the fleets in.

I liberate the oppressed prey of Berserkers, set free those under the yoke of Empire Builders like Merchants and Artifact collectors.

And what do I take in return? I do not seek to kill populations or make people work hard on my fleets, all I ask for the liberation of the oppressed is a little piece of the boodle, a few spondulix, some wherewithal, little to ask for my services to life-kind.

It must be shown that aggression does not pay, aggressors must be punished, and I am the man capable of such a feat.

I am amassing a Task Force.

A collection of fleets, this force will be so fast that when in Battle formation it will almost blot out the most powerful of Suns.

A force so huge and powerful that Berserker robots will quail at its presence, and Apostles will pray at its coming.

This task force will be headed by myself in the flagship, A.C. Freedom-for-All ready to wage terrible war on evil-doers.

We will fight them on the Space-lanes, at the planets and near the Black Holes, there will be blood, oil, and tears, but we will never surrender . . .

There is No Alternative but to stand up and fight. The time for Diplomacy is over, the time for action is here. Fight, we will, for the elimination of Berserkers and life-kind's inexorable right to be free!

I am so cool I could fluster a Penguin, and I am so hip I have difficulty seeing over my pelvis.

Never let it be said that Austin Cambridge did not play the major role in the freedom of the Galaxy.



ZX Spectrum JOYSTIX ! VIC 20 SOFTWARE

FROM **INTERCEPTOR MICRO'S**



INTERCEPTOR SOFTWARE

At last, the ultimate in ZX add-ons has arrived. The unique board has been designed to take Atari* type or Commodore^x type joystix. The board will take two joysticks+ which are software programable using the in statement on your Spectrum. Just add a few simple lines to your programs for true arcade action. Supplied with full instructions and demonstration cassette for only

£18-95

**TRADE ENQUIRIES WELCOME
FOREIGN DISTRIBUTORS REQUIRED**

SOFTWARE FOR THE UNEXPANDED VIC 20

FROG



FROG

An amazing version of Frogger in the unexpanded VIC 20. With diving turtles and plenty of vehicles to run you down. Fast action and high resolution graphics. Joystix or Keyboard control

....£4.00

PUCKMAN



PUCKMAN — MACHINE CODE

The old favourite back again. Joystix or keyboard control. Fast action. High resolution colour graphics on the unexpanded VIC 20

....£6.00

SPACE TRAVEL



SPACE TRAVEL — MACHINE CODE

Zap your way through the myriad of invading aliens to survive. Keyboard or joystix controls, high resolution colour graphics

....£5.00

WORDHANGER



ATARI 400/800 16k

WORDHANGER

A highly educational hangman game with vocabulary and 2 player or play against the computer option

....£5.00

ALIEN ATTACK

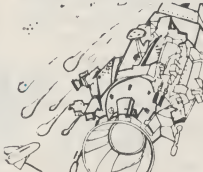


ALIEN ATTACK — MACHINE CODE

You are under attack from an immense force. This program has various ways for you to battle against giving an extra-terrestrial experience for any adventurous human being

....£6.00

VIC RESCUE

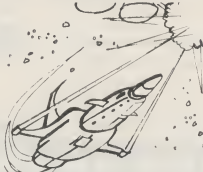


VIC RESCUE — MACHINE CODE

Your Planet is under attack by a fourth dimension and your only escape is by lunar pod to the mother ship. However you must first dodge your way through the Astroid belt and onto the landing pad before returning home. Keyboard or Joystix control, high resolution colour graphics

....£5.00

GALAXZIONS

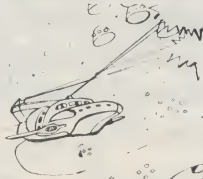


GALAXZIONS — MACHINE CODE

This is the most amazing alien game ever seen on the VIC 20. Galaxzions swarming in attack formation to destroy your planet. The nearest program to the real arcade game for the unexpanded VIC 20

....£7.00

SPACE BUGS



SPACE BUGS — MACHINE CODE

Can you defend your planet from an alien invasion. The Marauding bugs are swarming in for the kill. So keep on your toes, joystix or keyboard

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VIC BOMBER

An extremely fast action Bomber game for the Vic 20. With high resolution colour graphics. Flatten the enemy city before it's too late.

....£3.00

PENNY SLOT

This program is designed around a penny slot machine and gives true to life animated action. Try your luck to win a fortune. For Vic 20. With hold and nudge features for only

....£4.50

URGENTLY REQUIRED

Software and hardware projects for all micro computers. If you have written a program or designed an add-on then we will pay top cash or the highest royalties. So send in a demo now to: Interceptor Micro's, Lindon House, The Green, Tadley, Hants.

Mr, Mrs, Miss _____			
Address _____			
Quantity	Item	Unit Price	Total
	Joystix Board (Spectrum)	£18.95	
	Galaxzions Vic 20	£7.00	
	Space Bugs Vic 20	£4.00	
	Frog Vic 20	£4.00	
	Alien Attack Vic 20	£6.00	
	Bomber Vic 20	£3.00	
	Puckman Vic 20	£6.00	
	Space travel Vic 20	£5.00	
	Wordhanger Atari	£5.00	
	Penny Slot	£4.50	
	Vic Rescue	£5.00	
	Postage & Packing	.50P	
		TOTAL	
Send order to: Interceptor Micro's, Lindon House, The Green, Tadley, Hants			

* JOYSTIX SHOWN NOT INCLUDED *

Spectrum

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address.

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beaten on
price!**

SPECTRUM is a rapidly expanding group of independent retailers who specialise in selling home computers. Our group policy is simple - **WE WON'T BE BEATEN ON PRICE!** - our **BULK BUYING** ensures this. We select and buy the best and pass the savings on to **YOU**, the customer. We **GUARANTEE** that if you find an item currently advertised and in stock at another dealer and at a better price than ours - **WE WILL MATCH THAT PRICE ON THE SPOT.**

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(or prospective Computer Dealers!)

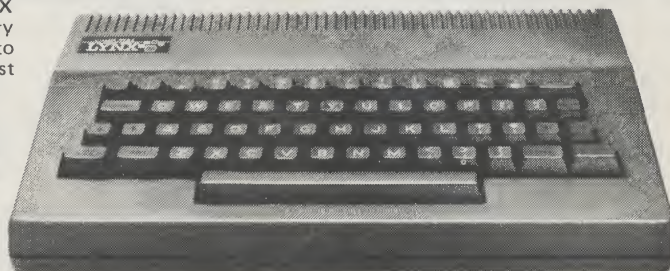
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Spectrum (U.K.) Ltd.,
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Spectrum are proud to offer you the very latest
'Best of British Micros'

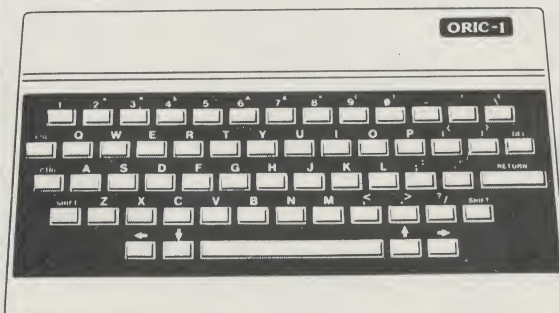
New! LYNX 48

Just look at this super new LYNX Micro - an incredible 48K of memory as standard and that's expandable to 96K, 128K, or even 196K! For just **£225.00 INCLUDING VAT** the LYNX is exceptional value and exceptionally versatile. All LYNX's 'add-on' connections are standard types. The massive memory and high definition colour graphics make it a top-value choice for the home or office (with 128K of RAM, the LYNX can become an 80 characters-per-line word processor!) Take a look at the LYNX - a memorable bargain from SPECTRUM. But please phone to check stock position before making a journey as this new machine is bound to be in great demand.



Spectrum **LOW** price **£225.00** Inc. VAT
(£195.65 ex. VAT)

VISCOUNT - Teach yourself LYNX BASIC £6.95



Spectrum **LOW** price **£99.95** Inc. VAT
(£86.95 ex. VAT)

ORIC-1 48K £169.95 Inc. VAT

ORIC-1

A superbly designed and engineered micro and great value-for-money from SPECTRUM. Offering 16K RAM Colour - 8 foreground and 8 background can be displayed at same time. High resolution graphics. User definable Graphics. Full sound with 6 octaves of controllable sound. Easy to use keyboard with moving keys. Standard Centronics parallel interface allows easy connection to a wide range of printers etc. Ask to see the new ORIC-1 at your local SPECTRUM dealer today!

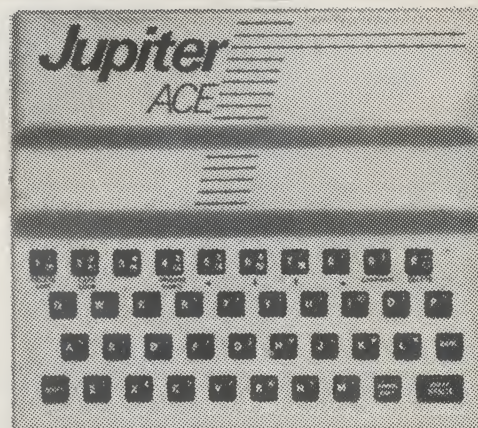
VISCOUNT - Teach yourself ORIC BASIC £6.95

JUPITER ACE

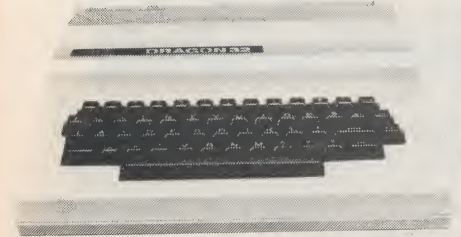
Outstanding value-for money! The JUPITER ACE uses easy to understand FORTH language. Connects to your own TV. 3K RAM expandable to 16K. Full moving keyboard with auto repeat and caps lock. Full sound and chunky graphics. Ideal for the home, office or schools etc. Supplied complete with mains adaptor, TV and cassette recorder connection leads etc. See it at your local SPECTRUM dealer NOW!

Spectrum **LOW** price **£89.95** Inc. VAT
(£76.22 ex. VAT)

VISCOUNT - Teach yourself FORTH £6.95



HURRY! Limited stocks only - DRAGON 32 MICRO



Unbelievable value at only £173.00 from SPECTRUM! British built and designed it's one of the most impressive micros to appear for quite some time. Extensive facilities include highly advanced colour graphics. Just look at this top specification: Powerful standard 32K RAM (expandable to 64K Bytes). ■ 9 Colour, 5 resolution Display. ■ Extended Microsoft colour BASIC (as standard). ■ Advanced sound with 5 octaves - 255 tones. ■ Professional style editing, e.g. extract line, auto find reinsert. ■ Professional quality keyboard. ■ Centronics Paralled printer interface. ■ Serious programmer/user - the BASIC on this machine is similar to that found on machines costing 3 times the price! ■ Uses almost any cassette recorder. ■ Standard file handling ON TAPE.

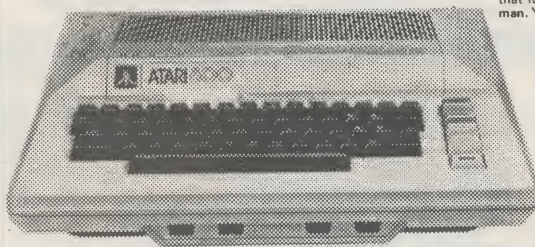
Spectrum LOW price
£198.95 INC. VAT
(£173.00 exc. VAT)

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CARTRIDGES			Selection of Games 1	£6.91	£7.95
Beserk	£17.35	£19.95	Selection of Games 2	£6.91	£7.95
Cosmic Invaders	£17.35	£19.95	Selection of Utilities	£6.91	£7.95
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Computavoice	£6.91	£7.95			
Graphic Animator	£6.91	£7.95			

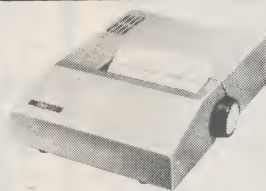
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ATARI

ATARI 800 16K RAM



ATARI 400
16K RAM
£198.95
INCLUDING V.A.T.
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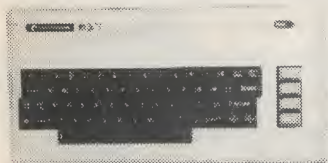
The top selling ATARI 800 at a sensational new LOW LOW price from SPECTRUM. It's the ideal home or business computer with an extensive range of EDUCATIONAL, GAMES, PERSONAL FINANCE and BUSINESS programmes and aids available. It features a typewriter keyboard, 16K memory that's easily expandable to 48K with convenient, slip-in ATARI Memory Modules. It's expandable, which means you can build the computer system you want today, knowing that it will grow to meet your needs tomorrow - making it ideal for the business man. You can add printers, programme recorders, disk drives and more.

Sensational NEW LOW Price
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Commodore VIC-20



Sensational NEW LOW price
£139.90 INCLUDING VAT
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New! COMMODORE 64

Just Arriving

Limited stocks are just arriving of this super new micro. Just look what it offers!

■ 64K Ram ■ Z80 processor option ■ Dedicated video chip ■ Sprite graphics ■ Music synthesizer ■ Prestel link ■ High resolution graphics (320 x 200) ■ 16 colours and lots more.
£344.99 INC. VAT.

Now a top quality home/business micro for the price of a games machine.

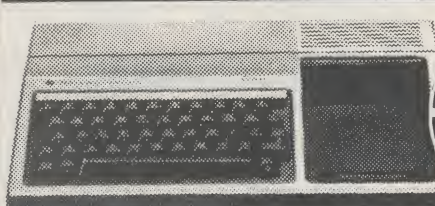
■ Memory expandable to 32K ■ High resolution (full PET type) graphics ■ 16 Screen colours and 8 border colours ■ Plugs in to your TV. or monitor ■ Add Disk Drive & Printer for impressive 170K Byte system ■ Can act as an intelligent terminal for a larger computer.

VISCOUNT SUPER X2
64K DYNAMIC RAM PACK for VIC-20
EXCLUSIVE TO SPECTRUM!

Unbelievable-but-true, now you can up grade your VIC-20 from 3.5K to a massive 67K RAM. Enables you to load up to 8 games or programs at a time & still select which one you wish to use. Can be used in conjunction with other expansions to increase total memory up to 152K-using the VIC memory expansion board. The SUPER X-2 will make your VIC-20 the biggest little micro in town!

Spectrum LOW price
£114.94 INC. VAT
(£99.95 excluding VAT)

TEXAS T199/4A



Sensational
£50 CASH BACK OFFER!
£50 CASH REBATE WITH EVERY TEXAS T199-4A PURCHASED
Please ask for full details
Offer expires 31.1.83

■ 16K RAM (expandable to 48K) ■ Built-in 14K Byte BASIC interpreter ■ 16 Bit Micro-processor ■ 16 Colour High Resolution graphics ■ Extensive range of solid state software command modules available from games to architectural aids.

Spectrum LOW Price
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TEXAS PERIPHERALS	EX. VAT	INC. VAT		EX. VAT	INC. VAT
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Spectrum

A few examples from our Software Selection

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Super Worm	£4.49
Jungle	£4.49
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Code Breaker	£4.49
Night Flight (3K)	£4.49
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Rabbit Base (16K Cassette)	£14.49
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Night Crawler	£9.49
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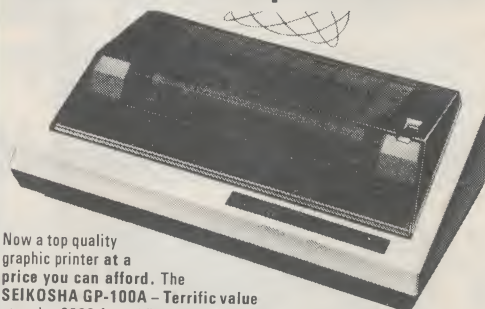
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The Zx Spectrum and how to get the most from it	£5.95
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Vic Revealed	£10.00
De RE Atari	£17.00
ATARI Operating system listing	£10.43

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Spectrum LOW price £229.94 (Price Ex. VAT £199.95)

Also Available	EX. VAT	INC. VAT
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Cables for BBC MICRO, ACORN, DRAGON		
	£19.58	£22.52

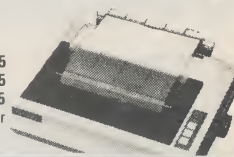
	EX. VAT	INC. VAT
DRAGON (Std.)	£12.95	£14.89
Accessories		
Data Sheets GP-100 (packet 100)	£17.00	£19.55
Data Sheets GP-250 (packet 100)	£17.00	£19.55
Ribbons GP-100 (box of 12)	£5.00	£5.75
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Chosen by SPECTRUM for their reliability, the superb new top quality graphic printers from EPSON. New features include super & subscript, underlining & deletion. If you're looking for an up-market printer at a down-to-earth-price, call in and see the EPSON range at SPECTRUM.

Model	EX. VAT	INC. VAT
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Please see your SPECTRUM dealer for prices of INTERFACE/CABLE options.



ACCESSORIES

PRINCE 12" Green Monitor

ONLY
£98.90 Inc. VAT
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	Exc. VAT	Inc. VAT
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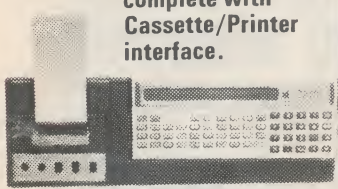
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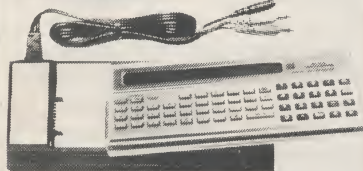
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COMPS NEWS

MYSTERY OF THE DARKLY GLOWING GEM

BLACK CRYSTAL

In order to win the Black Crystal you must first seek out the seven gold rings and place them on their pedestals — ranged in a circle around the brilliant gem.

But even before you get to see the crystal you will have to overcome dozens of dangerous challenges. The sheer number of episodes in this game make it one of the longest adventures ever written — with 12 different screen presentations.

As you pursue your adventure you have three main strengths to supplement your natural cunning. Physical strength consists of your two principal weapons, a sword and a shield.

Purity enables you to be brought back to life if you meet with a grizzly end at the claws of one of the dragons or vampires which haunt this adventure.

The spiritual strengths at your disposal are lightning and "power drain".

Black Crystal is available from Carnell Software of Slough at £7.50. The game runs on a Sinclair Spectrum in 16 and 48K and on a ZX81 in 16K.

BEWARE OF UNDERWATER ENEMIES

SUB TRACK

Sub Track is a new Spectrum version of an arcade game.

You command a destroyer being pursued by a fleet of enemy submarines. Your only defence is your depth charges which you must drop at just the right moment so that they will knock out the submarines a few seconds later as they pass below you.

Sub Track is manufactured by the new Spectrum writers — Amba Software of Cambridge.

Also in the range is an Adventure game called Treasure Hunt and a version of Pacman. The games cost £4.95.



WHEN IS A CASTLE A RIDDLE?

CASTLE OF RIDDLES

More prizes are on offer this month as the software houses compete to sell their goods.

Acorn goods worth £2,000 are up for grabs to the first person to solve the Castle of Riddles adventure for the BBC Model B.

This classic text only adventure has an added twist of humour with such gems as "What gets wet as you get dry?" Answer: a towel.

The release date of Castle of Riddles has been strictly timed so that any one who purchases

the game, whether by mail order or over the counter, will have an equal chance of getting hold of the game at the same time and entering the competition.

Other exciting prizes planned for 1983 feature a number of holidays to far-away places. Most interesting of these is Automata Cartography's trip to the U.S. to meet a mystery celebrity whose identity is hidden away in the bits and bytes of the new Spectrum game "My Name is Adolf Hitler, You Win a Fat Cigar". Who can the celebrity be? Who will win the prize? Will this reporter be going to the U.S. to cover this momentous meeting? All will be revealed in Games News soon.

Another holiday — destination undecided — it to be put up by Carnell Software of Slough for their next adventure game which will be the sequel to the epic Black Crystal adventure.

A JOLLY MIXTURE OF FUN . . .

COMPENDIUM

That Rolls-Royce of board games, the De-Luxe Compendium is now a thing of the past as all the family favourites such as Snakes and Ladders, Ludo, Fox and Geese, Beetle, and even Noughts and Crosses can all be stored on one computer cassette.

The computer compendium

has a number of advantages over the traditional board version. It is impossible to lose the counters and the dice or other essentials to play as these are safely stored away on the cassette tape.

Furthermore, in a game like Noughts and Crosses for example, you can play against the computer if you are short of another human opponent.

A games compendium for the Sinclair Spectrum in 16K has been produced by Dymond Software of Annan. It features the above five games and is available from the Dumfriesshire based firm at £4.95.

LAST REFUGE OF THE GALAXIANS

ARCADE CLASSICS

Arcade classics Galaxians and Defender are enjoying a new lease of life as games manufacturers regularly churn out versions for the popular micros.

Defender is one of the few video games to come out of the boom period of 1980-81 to be still consistently earning ten pence pieces in the local pubs and arcades.

Its paintwork is probably now a little shabby but you can be sure that wherever a Defender machine is found there is also a small group of devotees regularly rescuing the humanoids.

The bluebottle like Galaxians have not been quite so fortunate. Pushed aside by Robotrons, Burgertimes, Pacmans, and more recently Pengos — it now seems that British Rail buffets and bars are the only sure places to find a Galaxians machine these days.

Whatever the future holds for these quaint old relics of the pay-as-you-play games era you can still enjoy them as versions are now on sale for the BBC Model B, and Atari 400 and 800.

Cambridge based Acornsoft produce the games for the BBC machine — though sold under different names Planetoid is Defender and Arcadians is Galaxians.

The Atari versions are available under the original names although the retail prices are not available as we go to press.



GO TO WORK SMASHING AN EGG!

EXTERMINATOR

If you shook with fear while watching Hitchcock's *The Birds* then you will be scared to learn that they are back. This time gunning not only for planet Earth but the entire universe!

You are charged with the mission of seeking out the birds' secret lair on the planet Dron. This is where they lay their eggs and hatch their plot of intergalactic supremacy. The only way to stop the birds is to destroy their eggs.

Exterminator is the name of the game for the TRS-80 or Video Genie. It can be purchased from Algray software at £7.95.

Also new from Algray this month is a 3D adventure game called Double Agent. You are the spy who must break in to a high security fortress and escape with top secret plans. The game comes with a money-back guarantee from the Barnsley based company at £12.95.

SURVIVAL OF THE FITTEST AMOEBA!

EVOLUTION

Experience millions of years of evolution in a few minutes in this latest game for the Apple.

Only the strong survive in Evolution — sentiments which Charles Darwin would no doubt echo.

You begin the evolutionary cycle as an amoeba swimming in a fluid of DNA cells which you must try to consume to nourish your weak one-celled life form. Spores, microbes, and antibodies are also struggling for supremacy and will feed



on you if they can touch you.

If you survive the amoeba stage you then jump a few million years to become a frog. This time flies are your food source and fish your competitors.

From frog you go on to rodent, then beaver, then gorilla and finally human. The game does not end there. A final battle must be fought with the mutants followed by a nuclear war which could just spell doom for the human race.

Evolution was written by two Canadian teenagers who brought it into the offices of a Vancouver based business software house.

The firm liked it so much they decided to market it. And now the youngsters are predicted to be thousands of dollars better off by the end of 1983 according to the managing director of the company.

The game is produced by the Sydney Development Corporation — a Canadian business software firm. It is available in this country from Pete and Pam Computers at around £20.

DOWN TO THE SEA AND SKY AGAIN

SUB COMMANDER

Submarine Commander and Jumbo Jet Pilot, the two TV advertised games from Thorn EMI for the Atari 400 and 800 will shortly be available for the Texas Instruments 99/4a.

The simulation games give you a taste of flying a Jumbo and commanding a submarine in war time. Both games feature a variety of realistic controls. Submarine Commander for example challenges you to destroy all enemy shipping operating in the Mediterranean.

You have sonar to help you find them when submerged, radar, oxygen level, fuel, battery charge, depth under your keel, periscope and screen presentations of the surface and sky line, a map of the Mediterranean, and radar scanner.

The games will be on sale towards the end of January at around £30.

WIN YOUR COWBOY SPURS . . .

CHISHOLM TRAIL

TI owners can look forward to a wider choice of games in the new year as some of the smaller software houses — currently manufacturing for the Vic, Spectrum, and BBC machines — are negotiating with Texas to produce games for the 99/4a.

The latest game

from Texas takes you back to the cattle trails of old Kansas with rustlers, wild steers and wranglers. For non High Chaparral fans a wrangler is a semi-legal rustler employed by a rival cattle herder to pick up the strays from your herd and then brand them with his own mark.

Chisholm Trail takes its name from the famous cattle trail between Texas and Kansas where many a cowboy earned his spurs. The aim of the game is to get your herd from Texas to Kansas with as few losses as possible.

The game is available from TI dealers now at around £22.

THE GAME OF THE BOOK OF THE FILM . . .

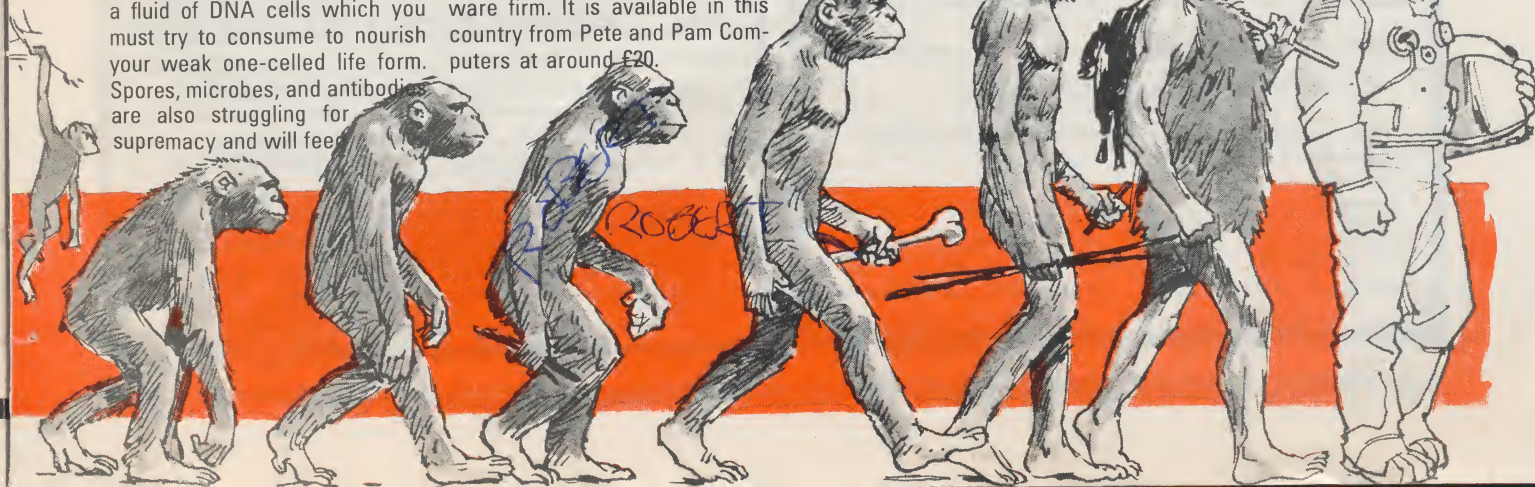
E.T.A.

The game of the film is the latest craze in computer gaming. The theory behind it is that if people will buy the book, record, T-shirt and even jig-saw puzzle of the film then why not buy the game of the film too.

The TV games centre manufacturers were the first into this profitable new business with games for current box office money spinners ET and Tron.

Hot on the heels of Atari's ET comes a version for the Spectrum in 16K and 48K from Automata of Southsea.

ET has crash-landed on Earth and has lost his memory. It's up to you to help him remember his name, and find his space craft before the wild dogs and evil military catch him. ETA is available at £5 from the Hampshire firm.



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Yes, it's true. Instant machine code from a good subset of BBC BASIC. Type your BASIC program into your model B BBC Micro, trigger the compiler, and your program is changed almost instantaneously into superfast machine code. For £34.95 you get: Cassette version of the complete compiler (along with a version of the compiler for use with discs, ready for when you upgrade, the disc version being dubbed on the cassette after the cassette version); complete compiler listing; extensive documentation and instructions. The compiler was written by Jeremy Ruston.

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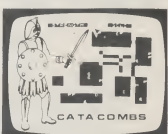


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NEW NEWS

UP, UP AND AWAY WITH SPECTRUM

FLIGHT SIMULATION

Fly the flag with this latest flight simulation from Psion Software. The game is the most sophisticated flight simulation ever produced for a micro-computer.

It represented a marathon programming exercise for the London based firm. It took over eight thousand man hours to complete with up to six programmers working on the project at any given time.

Many of the features of this flight program are straight from the cockpit of a Boeing 747.

The instrument landing system lines up a flashing dot with a cross which has been centred on the chosen airport.

All information systems are displayed as dials just as in a real plane. These tell you your altitude, rate of climb, speed, wind and weather conditions, and your position.

The game offers two screen presentations. The first of these shows the view from the cockpit with the instruments described above in the bottom of the screen and the view of the horizon in the top half of the screen. As the plane swoops down you can see land and lakes in the horizon appearing in front of you through the cockpit window.

The plane can be made to bank, roll, dive, climb and even loop the loop — though you will have to be a pretty good pilot to make it do this.

The second screen presentation shows a map with you plane flashing its rate of progress. The airports are represented as flashing beacons with the land and lakes shown.

Flight Simulation runs on a Sinclair Spectrum in 48K and is available from larger branches of W. H. Smith at £7.95.

Also new from Psion this month is a second Horace tape. The original Horace game featured the cute comic character running around a park being pursued by the attendants. They were chasing him because the

mischievous little glutton had just gobbled their sandwiches and eaten their prize winning daisies.

In this second episode Horace goes ski-ing. You have to get him across a busy road to the hut where he keeps his skis. Hobble back across the road with skis on and Horace can then begin his slide down the snowy slopes. Good luck Horace! Don't fall over!

Horace Goes Ski-ing runs on a Sinclair Spectrum in 16 or 48K and is in W. H. Smith stores now, at around £6.

GAME FOR A LAUGH ON THE ZX81

GAMES PACKS

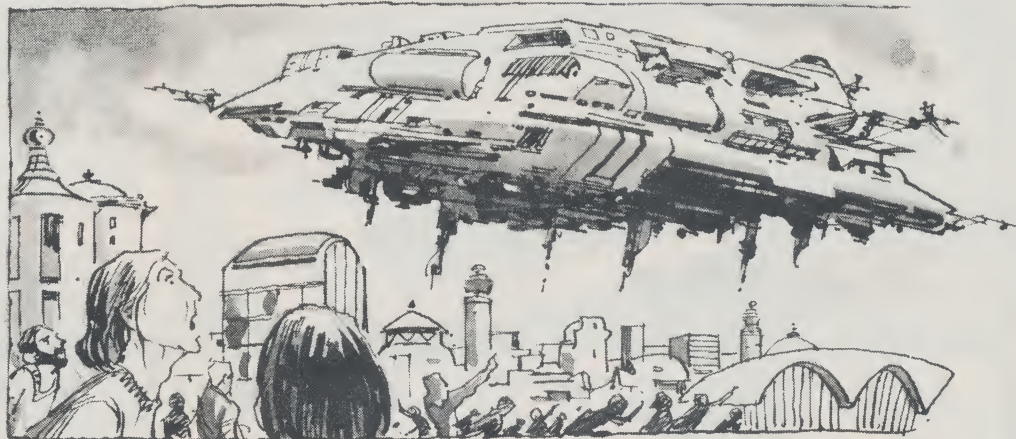
Two new games packs for the ZX81 add another thirteen games to choose from to the now enormous range of games available for the daddy of micros.

Both tapes run on the unexpanded machine in 1K.

You must provide an escort for the fuel ship and also fight off attacks from hostile aliens. Each time a meteorite hits the force field, more of the city's precious supply of energy is used up.

If an enemy saucer penetrates your defences they will then be able to score a direct hit on Outworld. It only takes one bomb from a barbarian ship to destroy the civilisation.

Outworld is the latest game from Reading-based Audiogenic for the Vic-20. The game is available at £34.95.



NEWCOMER MEETS OLD FAVOURITES

DRAGON GAMES

A steady trickle of new games manufacturers are beginning to sell games for the new Dragon computer.

Games Pack One — from John Morrison of Glendale Street, Leeds, is an example of some of the new software now coming available. The cassette features five well known games Othello, Awari, Moonlander, Breakout and an original game, Raffles.

Raffles is a mini-adventure game where you have to explore a honeycomb of mysterious rooms searching for treasure.

John Morrison also offers two classic adventure games Stalag, and Worlock.

The above cassettes together with another Games Pack featuring Space Invaders, Lunar Lander, and a Centipede-type game are on sale now from the Yorkshire-based firm at £5.75.

Games Pack One features Air Sea Rescue, Invaders, Message Writer, Demon Driver, Breakout and Squash.

Games Pack Two features Jump Jockey, Asteroids, Invaders (part 2), Stunt Cycle, Noughts and Crosses, Enterprise and Sketch.

Both games are available from Database Software of Stoke-on-Trent at £4.75.

DEFENDING THE BLUE DREAMWORLD

OUTWORLD

The architecture of the city of Outworld is amongst the most beautiful in the galaxy. It's tall blue buildings scrape the sky.

The city is the envy of several inferior races who seek to destroy it and deny the Outworldians their utopian life style.

Outworld's chief weakness is that it uses up vast amounts of energy to fuel the buildings and drive the protective force field which blankets the city.

DON'T GET CAUGHT ON THE HOP!

FROGS

Ribbit! Ribbit! Hi, my name is Frogs and I've just been hopped out of the arcades to become the latest game for the ZX81.

You can find me on the B side of the latest Psion game called Super Gloopier.

Frogs is a version of the popular arcade game Frogger in which you have to hop our hero to the safety of the bank on the other side of the river.

In Super Gloopier you must paint in as much of the maze as possible before the guards catch you.

Also new from Psion this month and bringing a touch of arcade action to your ZX81 is Thru the Wall and Scramble.

Thru the Wall is a version of the early arcade hit Breakout.

Super Gloopier and Thru the Wall are available from W. H. Smith at £4.95.

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Don't buy a T.V. game! Buy an Atari 400 personal computer and a game cartridge and that's all you'll need. Later on you can buy the Basic Programming cartridge (£35) and try your hand at programming using the easy to learn BASIC language. Or if you are interested in business applications, you can buy the Atari 800 + Disk Drive + Printer together with a selection of business packages.

Silica Shop have put together a full catalogue and price list giving details of all the peripherals as well as the extensive range of software that is now available for the Atari 400/800. The Atari is now one of the best supported personal computers. Send NOW for Silica Shop's catalogue and price list as well as details on our users club.

THE FOLLOWING IS JUST A SMALL SELECTION FROM THE RANGE OF ITEMS AVAILABLE:

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ADVENTURE INT Scott Adams Adv No 1 Adventure Ind No 2 Pirate Adv No 3 Mission Imp No 4 Voodoo Cast No 5 The Count No 6 Strange Ody No 7 Mystery Fun No 8 Pyramid of D No 9 Ghost Town No 10 Sav Island 1 No 11 Sav Island 2 No 12 Golden Voy Angle Worms Deflections Galactic Empire Galactic Trader Lunar Lander	AUTOMATED SIMULATIONS Crush Crumble Cmp Datesones of Ryn Dragons Eye Invasion Orion Rescue at Rigel Ricochet Star Warrior Uppod of Apshai Upper Reaches Aps BOOKS Basic Ref Manual Compute Atari DOS Compute Bk Atari Compute Magazine De Re Atari DOS Utilities List DOS Manual Misc Atari Books Op System Listing Wiley Manual	EDUCATION from APX Algalcalc Atlas of Canada Cubbyholes Elementary Biology Frogmaster Hickory Dickory Inst Comptg Dem Lemonade Letterman Mapware	EDUCATION from ATARI Conv French Conv German Conv Italian Conv Spanish Energy Czar European C & Caps Hangman Invit To Prog 1/2/3 Kingdom Music Composer	ENTERTAINMENT from APX Alien Egg Anthill Attank Avalanche Babel Blackjack Casino Block Buster Block 'Em Bumper Pool	ON LINE SYSTEMS Crossfire Frogger	ENTERTAINMENT from ATARI Asteroids Basketball Blackjack Centipede Chess Entertainment Kit Missile Command Pac Man Space Invaders Star Raiders Super Breakout Video Easel	PERSONAL INT from APX Adv Music System Banner Generator Blackjack Tutor Going To The Dogs Keyboard Organ Morse Code Tutor Personal Fitness Prg Player Piano Sketchpad	SANTA CRUZ Basics of Animation Bobs Business Display Lists Graphics Machine Kids 1 & 2 Horizontal Scrolling Master Memory Map Mini Word Processor Page Flipping Player Missile Gr Player Piano Sounds Vertical Scrolling	SILICA CLUB Over 500 programs write for details

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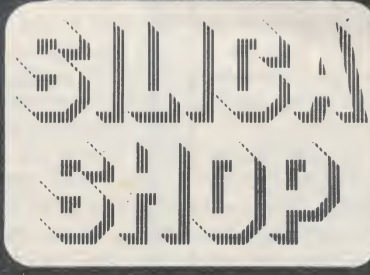
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PRESTEL

THE SHAPE OF THINGS TO COME

Prestel, as you may know by now, was a marvellous idea to send constantly updated information down the phone wire.

A small adaptor was plugged into your office phone line, and it turned telephone signals into the right kind of weak electric currents which you could feed into the aerial socket of an ordinary T.V. set. And the buzzes and whistles which came down the Prestel phone wire reconstituted themselves into pictures on your screen — showing stocks and share prices, or railways timetables, or the day's latest newsflashes.

Now I'm talking about all this in the past tense, because those particular uses of Prestel are rather fading into history.

THE HOOK...

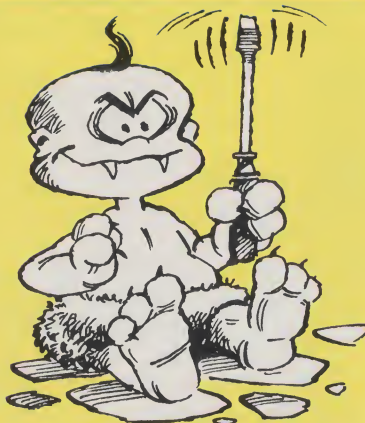
Prestel never really caught on with people sitting round the telly at home because static screens of information look rather boring, and there was nothing much on Prestel that you couldn't find out by simply looking in a newspaper — which is far cheaper than the £100-£150 or so which the phone-line adaptors would cost!

But now there's a new home-orientated use for the Prestel idea: instead of just sending pages of information to read off your screen — like the BBC's Ceefax, or ITV's Oracle — it's possible to send home-computer programs down the wire. And to make it cheaper for everyone to hook up to the service, British Telecom and the publishers of *Computer & Video Games*, EMAP have got together to provide a £49.95 phone-to-computer adaptor.

IN THE NET...

Programs will be available from January on this new service — which is called Micronet 800. "Micronet" because it'll evolve into a network for microcomputers, and "800" because that's the number which existing Prestel users tap into

Peter Linton takes a break from our Prestel page this month as DAVID BABSKY brings you up to date on a brand new and exciting development — Micronet 800.



their keyboard to get to the Micronet area of Prestel.

The first few hundred programs on Micronet 800 will be for the BBC A and B micros, the Apple computers, TRS-80s RML 380/480Z machines, and Commodore Pets.

Phone adaptors for these will be available straight away. And they'll be followed shortly afterwards by programs for the Sinclair machines, as Clive is due to make phone-to-Spectrum and phone-to-ZX81 adaptors available at the beginning of '83.

These adaptors are all (except for the Sinclair versions) what's called "acoustic modems" — acoustic means they operate by sound waves. So there's no direct attachment to the phone line; you just put your telephone receiver into the two plastic cups on the adaptor, and your micro and Prestel then talk to each other just like an ordinary human conversation!

This acoustic coupling cuts out the need to actually have British Telecom come round and add an extra "hard-wire" connection to

C&VG has come to a deal with Micronet over games programs and any you send in for whatever micro, we will pass onto the Micronet validation team. So, as well as seeing your program published in C&VG, you'll have a chance of earning royalties from Britain's latest electronic magazine.

your telephone system. And it also means there's no chance of any unusual voltages jumping back and forth between your computer and the phone line.

The choice of programs seems extremely varied: there'll be educational programs to use in schools and colleges, games programs similar to Pacman and space invaders and then out of the home league there'll also be business programs.

Acornsoft have put some of their BBC programs onto Micronet; Bug-Byte, Microdeal and Bridge Software are just some of the firms with ZX81 programs on the system.

These programs — and all the others from major distributors — will cost far less on Micronet than they do if you buy them in a shop or by mail-order.

There are also hundreds of free games on Micronet, and the chance to win big prizes.

THE SYSTEM...

The whole idea of this programs-down-the-phone-line excitement came about through carefully evaluating what goes into a proper purpose-built Prestel receiver.

It has a screen — but so has a home computer. It has an alphanumeric keyboard — and so, too, does every personal computer.

Some Prestel sets, only have a numeric keyboard, and these can't be used for sending messages to other users. With a home computer you can type electronic messages to all or any other Micronet users!

Home computers also have in-built memory, and cassette or disc recorders for storing information — so once a program has come down the line you can keep it for ever! Thus it was just one small logical step from using a home computer to process information, to using it to retrieve or receive that games-program information from a central Prestel or Micronet computer.

Incidentally, Micronet are paying a handsome 20% royalty on any programs of yours that they put on the system. Their address is Peter-sham House, 57a Hatton Garden, London EC1N 8JD.



A SPACE NIGHTMARE.

A fleet of hostile hamburgers appears on the screen, and the nightmare begins. Keep firing! Keep moving! Because if you get past the burgers, a school of belligerent bow ties is waiting to see what you've got.

And so it goes. Wave after wave of everyday objects come at you with increasingly difficult patterns of attack and evasion. And the better you get, the better they get.

The attack is so terrifying, you just might call it the worst thing you've ever seen on television. We call it MegaMania™, a new video game for your Atari® Video Computer System™. Designed by Steve Cartwright.



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TAMING THE INVADERS

David Langford discovers that there is more than just one way to save planet Earth

Once again those vile space invaders hang in the sky. Once again they throb their evil way downward, and once again it's only your staggering marksmanship which can save Earth from being overrun.

Difficult, isn't it, to read these stirring words without suppressing a yawn? But there may be a new twist to the old game yet.

Since the days of H. G. Wells's *The War of the Worlds*, the trend in science fiction has been for our heroes *not* to zap the alien hordes on sight, but to try and establish some kind of communication.

For some strange reason games programs have lagged behind, perhaps because shooting space invaders seems more exciting, perhaps because it looks more difficult to program for communication.

We can keep the element of threat in a game of communication by remembering all those SF stories in which the tiniest misunderstanding leads to total and terrifying war.

In Joe Haldeman's novel *The Forever War*, it's just a small communication error which causes the thousand-year interstellar war between Us and Them.

A man in one of James White's stories tries to win the favour of cuddly aliens by kissing babies, but unfortunately the aliens assume that this Earthling carnivore is merely *hungry*.

Rather more subtle is *Peace* by Ian Watson, where war is provoked only when humans ask the aliens to agree to a peace treaty.

The aliens' reasoning is, roughly, "If these humans are so barbaric and obsessed with war they need a special treaty to prevent them from fighting, it is clear that they are deeply in need of extermination."

Back to the keyboard. Imagine a program scenario in which an alien fleet advances slowly on you, waiting for intelligent signals but with its patience slowly dwindling, while the only weapon you have is some means of transmitting messages — plus, of course, your own gigantic intelligence.

This is a highly realistic situation, come to think of it. These are all the weapons most of us have against such loathsome beings from beyond the outer galaxies as the Inland Revenue, the Post Office, Customs & Excise...

In the listing as given here, you can bash out signals to the alien horde as fast as you like. Every so often another invader joins the fleet in the skies; eventually they'll overrun you by sheer weight of numbers.

But when one of your messages is such that the aliens decide you may be



intelligent, they pause and retreat a little.

If you can manage a whole *series* of "intelligent" signals to the invaders, then each successive signal will normally cause a bigger retreat until at last the sky is clear again — but a mistake may set you back to square one! It's up to you, then, to work against time and deduce what sort of simple messages can persuade the aliens to go away.

Beware: there are traps. Because aliens are deeply suspicious of mere repetition — you might only be a parrot — the same message will not work twice.

Obviously you can rewrite the program to change the type of intelligent signal for which it looks. A little study of the listing here will tell you the method used in my prototype program, though it won't help much if you want to cheat: in any case it's more fun to discover these things by playing the game than by analysing the listing.

You could easily alter the program to make the key signal a particular computer-generated key word, so the game would become something like Mastermind or Hangman played against time. Or perhaps the aliens themselves could

be made to send signals, to which you have to respond, following alphabetical or mathematical sequences which you must get right? Or, ultimately, the computer could generate an artificial alien 'language' in which they talk to you, your job being to decipher enough of it to send peaceful messages back... but perhaps the ideas are now getting a bit ambitious for a mere micro.

As usual, the listing is for a TRS-80, level II — but I'm buying another computer soon! As usual, you're encouraged to adapt the program to whatever other machine you may have — there are no particular subtleties.

Note that line 60 puts together the graphics for an invader. To make the game run faster, you can reduce the value of TM in line 2030 — beginners may prefer to increase TM and slow the game down. To increase the playing time — after which the aliens lose patience and swarm over you — increase the value of K in the same line.

So once again the enormous fleet of space invaders darkens the sky. Only you can save the Earth from being overrun. From deep in the armoured command base, you aim your mighty radio antenna and type: "Hello..."


```

10 ' "SPACE DYSLEXICS" copyright (C) David Langford 1982
20 RANDOM
30 CLEAR1000
40 DIMW$(25)
50 DEFINT P-Z
60 A$=CHR$(166)+CHR$(167)+CHR$(132)+STRING$(9,32)
70 B$=CHR$(12,32)
80 E$=CHR$(13)
1000 ' Game information
1010 CLS
1020 PRINT6400;"***** ALIEN CONTACT *****"
1030 PRINT6400;"THE SPACE INVADERS ARE COMING... IN PEACE?"
1040 PRINT
1050 PRINT"BEAM ONE-WORD MESSAGES TO THEM (NO REPEATED LETTERS OR WORDS-
1060 PRINT"ALIENS ARE TOUCHY ABOUT THESE THINGS, AND TRY TO ESTABLISH
1070 PRINT"CONTACT. PERSUADE THEM PEACEFULLY TO GO AWAY..."
1080 PRINT80;"",
1090 FORI=1TO800
1100 PRINTA$;
1110 FORJ=1TO200:NEXT
1120 NEXTI
2000 ' Set up variables and display

```

```

210 CLS
2020 P=0:N=0:L=0:WC=0
2030 DP=12:RP=1:K=250:TM=50
2040 Y=64:RND(26)
2050 N=Y+RND(N)-26
2060 IFN>RND(25)
2070 NN=Y+RND(N)-26
2080 IFNN>RND(25)
2090 Y$=CHR$(Y)
2100 N$=CHR$(NN)
2110 NN$=CHR$(NN)
2120 PRINT8936;STRING$(64,140);
2130 PRINT"START SENDING MESSAGES NOW...";
3000 ' Update display - input letter
3010 PRINT8P;A$;
3020 P=P+DP
3030 GOSUB10000
3040 IFP>959THEN9030
3050 FORI=1TOTM
3060 X$=INKEY$
3070 IFX$<" "THEN4010
3080 NEXTI
3090 GOT03010
4000 ' Process message letter by letter
4010 IFX$=E$THEN5010
4020 IFX$="A"ORX$="Z"THEN7010
4030 IFL=10THEN7050
4040 L=L+1
4050 IFL=1THEN4090
4060 FORJ=1TOL-1
4070 IFX$=T$(J)THEN7030
4080 NEXTJ
4090 T$(L)=X$

```

```

4100 IFX$=Y$THENQ=Q+1
4110 IFX$=N$ORX$=NN$THENQ=Q-1
4120 PRINT8960;"TRANSMITTING: ";
4130 FORI=1TOL
4140 PRINTT$(I);
4150 NEXTI
4160 PRINT8$;B$;
4170 GOSUB10000
4180 GOT03050
5000 ' "Transmit" and analyse complete message word
5010 IFL=0THEN7010
5020 IFL<4THEN7070
5030 W$="";W$=" "
5040 FORI=1TOL
5050 W$=W$+T$(I)
5060 NEXTI
5070 J=0
5080 FORI=1TOL-1
5090 IFT$(I)=T$(I+1)THEN5140
5100 J=1
5110 Z$=T$(I)
5120 T$(I)=T$(I+1)
5130 T$(I+1)=Z$
5140 NEXTI
5150 IFJ=1THEN5070
5160 FORI=1TOL
5170 W$=W$+T$(I)
5180 NEXTI
5190 FORI=1TO25
5200 IFW$=W$(I)THEN7090

```

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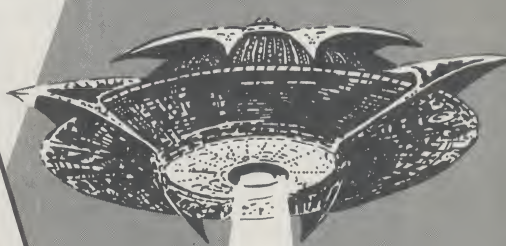
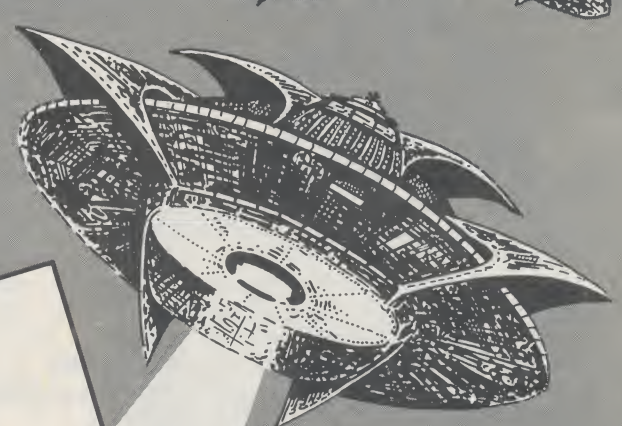
5210 NEXTI
5220 WC=WC+1
5230 IFWC>25THENWC=1
5240 W$(WC)=W$
5250 L=0
5260 FORI=1TO10
5270 PRINT8974;W$;
5280 FORJ=1TO30:NEXT
5290 PRINT8974;B$;
5300 FORJ=1TO30:NEXT
5310 NEXTI
5320 D=0+3*Q=0
5330 ONOGOT07130,8010,3050,6010
5340 ' Partial alien retreat on successful message
6000 ' FORI=1TORP
6010 RP=DP
6020 P=P-DP
6030 IFP<=0THEN9000
6040 PRINT8P;B$;
6050 NEXTI
6060 RP=RP+1
6070 GOSUB10000
6080 GOT03050
6090 ' Failure messages
7000 ' PRINT8960;"ILLEGAL CHARACTER";
7010 GOT07100
7020 PRINT8960;"LETTER REPEATED";
7030 GOT07100
7040 PRINT8960;"WORD TOO LONG";
7050 GOT07100
7060 PRINT8960;"WORD TOO SHORT";
7070 GOT07100
7080 PRINT8960;"REPETITION/PERMUTATION";
7090 PRINT8960;"REPETITION/PERMUTATION";

```

```

7100 Q=0:L=0:RP=1
7110 PRINT"; START AGAIN";
7120 GOT03010
7130 RP=1
8000 ' Penalty
8010 RP=RP-1
8020 GOT03010
9000 ' Finish - restart
9010 PRINT80;"YOU HAVE COMMUNICATED AND MADE PEACE..."
9020 GOT09050
9030 PRINT80;"YOU HAVE UTTERLY FAILED TO COMMUNICATE..."
9040 PRINT80;"AND HAVE BEEN OVERRUN BY UNCOMPREHENDING ALIENS."
9050 PRINT8960;"PRESS ANY KEY TO RESTART.";B$;
9060 X$=INKEY$
9070 IFX$<" "THEN9070ELSE2010
10000 ' Scorekeeper subroutine
10010 K=K-1
10020 PRINT8013;"SCORE";K;
10030 IFK>0THENRETURN
10040 TM=1
10050 PRINT8960;"THE ALIENS' PATIENCE IS EXHAUSTED...";
10060 RETURN

```





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CHESS



Computers are well known to be weak at positional play, the intricate manoeuvring for a small advantage, such as a well-placed Knight. However, they also have problems with tactical play, even with what seems like the simple task of finding forced checkmates in positions where they are known to exist.

Look at figure one. This is an example of a "White to play and mate in two moves" problem of the kind often found in newspapers and magazines.

The first point to note here is that the specification for White to mate in two moves has no practical value. Chess problems are not game positions but artistic compositions on the 64 squares of the chessboard.

Solving a chess problem is not a matter of examining every possible sequence, but of identifying the composers' theme in setting the problem.

The use of a computerised "mate in two" program using exhaustive analysis sadly undercuts the aesthetic experience of problem solution.

Simply by considering every possible legal combination of two moves for White and one for Black, the program inevitably reveals the winning move. (The reader is left to discover the solution for figure 1 using either a computer or a human brain, as preferred.)

In finding checkmating sequences in positions that arise in practical play, very different methods need to be applied.

The longest variation in a checkmating sequence arising from play can easily be 7 or 8 moves (of each side) deep, so analysing every possible combination as a general solving method if completely out of the question.

On the positive side, the moves in a checkmating sequence from play are usually fairly obvious ones of a forcing nature, such as checks and captures (or sacrifices of material) whereas those in composed problems are frequently "quiet" or unlikely moves, such as a Bishop move one square further away from the scene of battle, which are difficult to perceive even for strong over-the-board players.

The MATER program of George Baylor and Herbert Simon which appeared in the mid-sixties was an early pioneering attempt aimed at finding forced checkmates in game positions, given that they are known to exist, of necessity employing "Artificial Intelligence" rather than "brute-force" means.

Figure 2 is a fairly straight-forward example of the positions solved by the first version of the program, MATER 1.

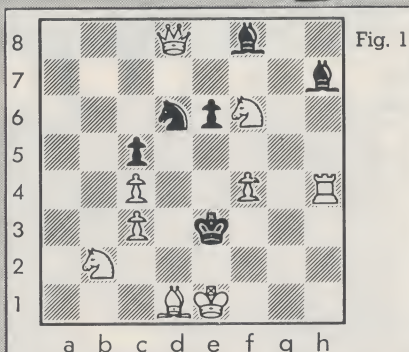


Fig. 1

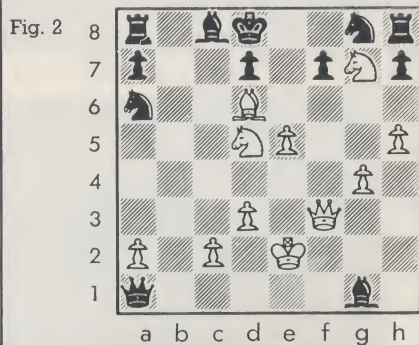


Fig. 2

The major difficulties with any such program are deciding what moves to consider and in what order, and at any point in the analysis deciding what to examine next.

Deciding when to stop analysing a line is probably the hardest task of all. A badly written program might spend many hours, days, even longer, looking at variations beginning 1. P-QR3, Q-R7; 2. K-Q2, Q-R8; 3. P-R4, etc., which humans would discount at a glance.

MATER's choice of moves to examine is simple but works quite well. At any move for White (assumed to be the winning side), only checks are considered and at every White move preference is given to the check which leaves Black the fewest legal moves in reply.

As will be seen below, this may involve abandoning the current line of analysis and starting another.

Any White moves which give Black more than four legal replies are automatically discarded. Any remaining choice amongst White moves is resolved by giving priority to double checks, then to checks with no capturing replies.

When it is Black's turn to move, all legal moves must be considered, but there is a considerable advantage in looking first at those moves which are the most likely to refute White's attack.

For this reason, MATER looks first at Black moves which capture as valuable a White piece as possible. If there is still a choice, King moves get priority.

This is how MATER solves the position in figure 2.

1. Generate all White checking moves. 1. Q-B6ch has two legal replies. 1. N-K6ch has 3 and 1. B-B7ch and 1. B-K7ch each have one.

2. Choose. 1. B-K7ch (arbitrarily) from the last two for analysis, on the basis of minimising Black's replies.

3. Generate Black's forced reply 1. ... NxB.

4. Generate all White's checking moves. 2. N-K6ch is the only one and Black has three legal replies.

5. Choose a White move to examine next from those not yet considered. Candidates are 1. Q-B6ch (two replies), 1. N-K6ch (three replies), 1. B-B7ch (one reply) and 2. N-K6ch (three replies).

The 'best' one is 1. B-B7ch so the previously played moves (1. B-K7ch, NxB) are retracted and 1. B-B7ch is played instead from the original position.

6. Black's move is again forced, 1. ... NxB.

7. Generate White's checking moves. 2. N-K6ch (four legal replies) and 2. Q-B6ch (two replies).

8. Choose a move to consider next, from 1. Q-B6ch (two replies), 1. N-K6ch (three replies), 2. N-K6ch (four replies) and 2. Q-B6ch (two replies).

Since 1. Q-B6ch was generated first, it is chosen in preference to 2. Q-B6ch (both with two legal replies). So 1. Q-B6ch is now played in the original position.

9. Black now has a choice of two replies 1. ... NxQ and 1. N-K2. The capture 1. ... NxQ is tried first.

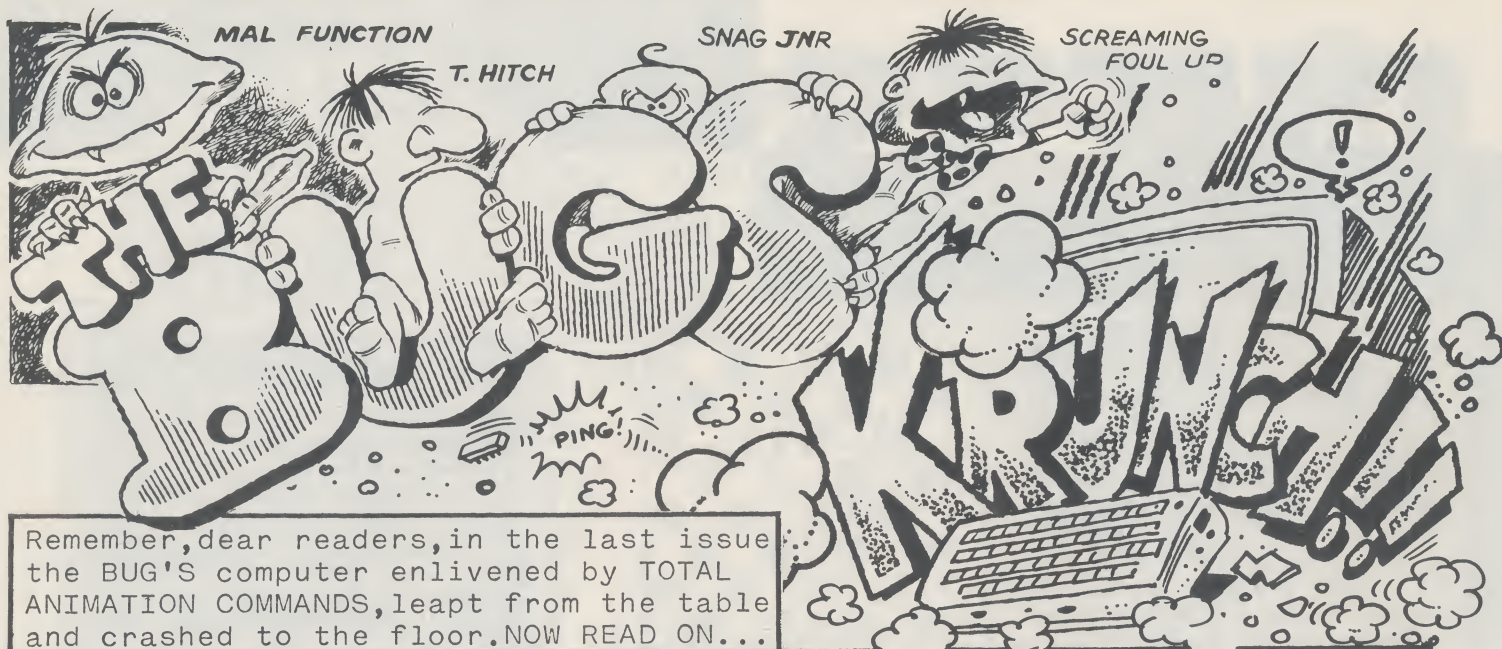
10. Generate White's legal moves; these include 2. B-K7 mate, which has no legal replies at all and is accordingly chosen to look at next.

11. Since 1. ... NxQ was unsuccessful, Black's only other legal reply to 1. Q-B6ch is tried, namely 1. ... N-K2.

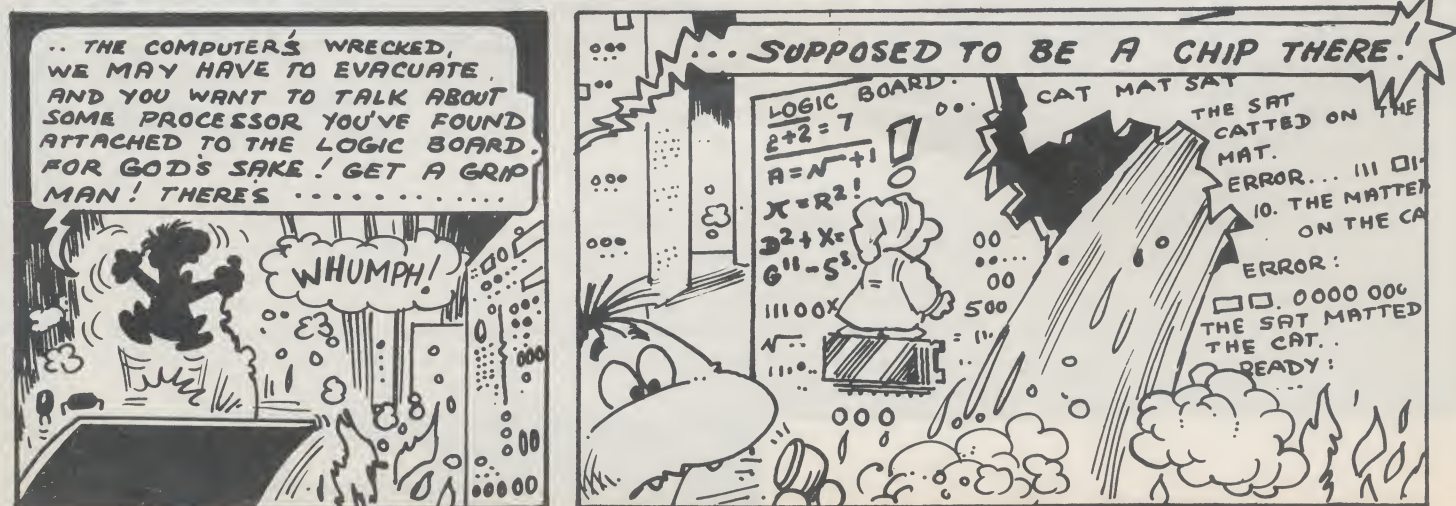
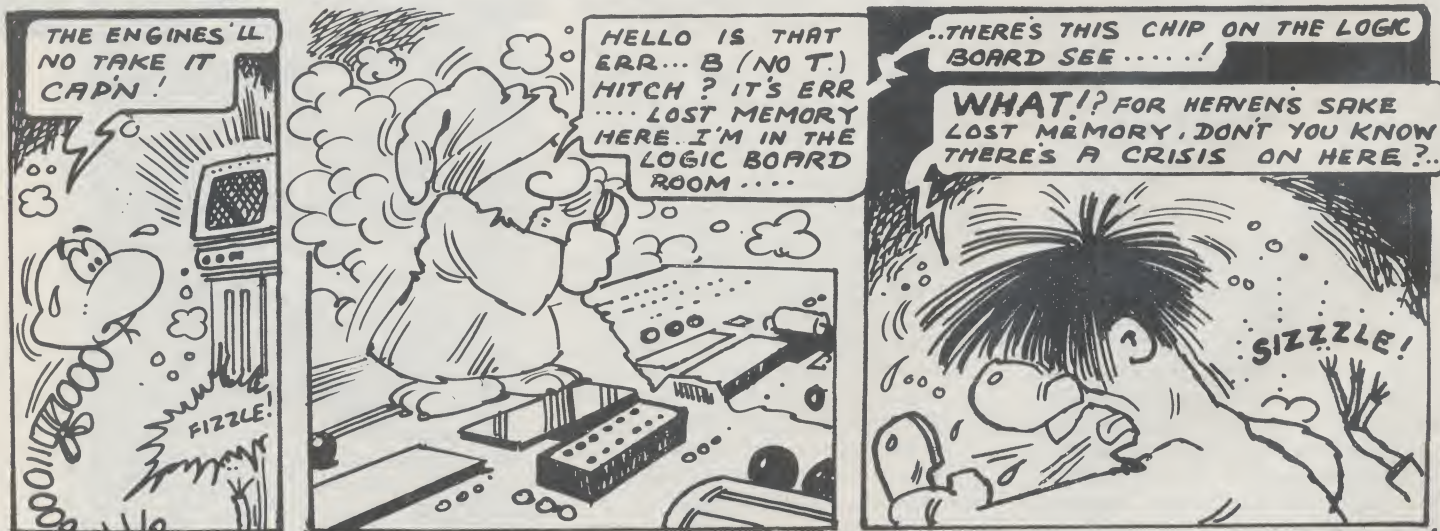
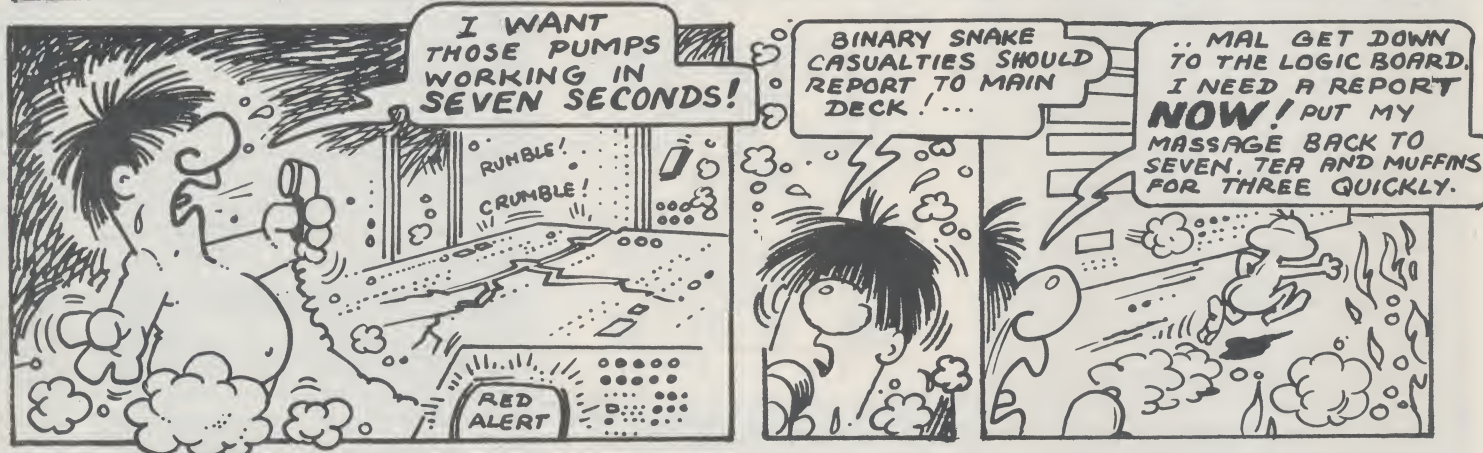
12. Generates White's legal moves; these include 2. BxNch which has no legal replies and is chosen to consider next. Since it has now been found that neither 1. ... NxQ or 1. ... N-K2 avoids checkmate, White's winning first move is established to be 1. Q-B6ch.

Although figure 2 is quite a simple position and one that, in isolation, could have been solved by an exhaustive "mate in two" program, the same method embellished to consider other forcing moves as well as checks for White can solve many other problems for which an exhaustive search method would be completely inadequate in any reasonable amount of time.

BY MAX BRAMER



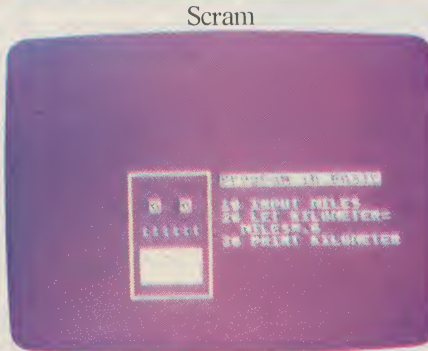
Remember, dear readers, in the last issue the BUG'S computer enlivened by TOTAL ANIMATION COMMANDS, leapt from the table and crashed to the floor. NOW READ ON...



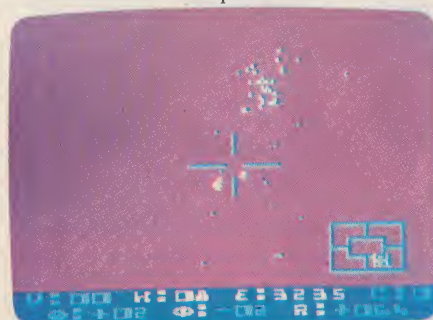
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SAVING THE MACHINE ASSEMBLER BLUEPRINT

What's got a machine, a monster and a beautiful maiden in distress. Blueprint — that's what.

This latest deviation on the maze-game theme is a novel new video which may pick-up some followers around the arcades once they get the hang of just what is going on.

You, the player, control a little chap known as J.J. His job is to assemble a machine which once switched on will save Daisy Damsel from the clutches of Ollie Ogre.

All J.J. has to do is collect all the parts of the machine from little houses situated in a sub-



urban maze, and build them into a "blueprint" at the bottom of the screen. At the top of the screen Ollie Ogre mercilessly chases Daisy — getting closer as you play.

If J.J. enters a house more than once he comes out with more than he bargained for — a fizzing bomb. This he must get rid of before it explodes — hopefully down Ollie's monster hole situ-

ated at the bottom right hand side of the screen.

The bombs prevent Ollie's monstrous mates from engaging in the annoying habit of nipping out and bouncing up and down creating a quake which shakes your machine to bits and gives you the assembly job all over again.

There are other dangers for J.J. to overcome, Ollie's mates, Sneaky Peter and Fuzzy Wuzzy appear to chase him around the maze and prevent him completing the machine and saving Daisy.

If J.J. manages to get all the parts in the right place and gets to the machine's on switch then a deluge of beach-balls are fired at Ollie — and if he is hit the story ends happily.

All in all it's a nice game — but you'll need a good few cracks at it before you get the drift of Blueprint.



You've heard of the game of the film — now see the film of the games.

Well, actually it's a video cartridge of a film which seems to have drifted into obscurity after playing second-fiddle to a horror movie while out on general release recently.

Called Arcade Attack it's an interesting semi-documentary concerned with the battle between the merits of pinball and video machines.

There's a lot of classic shots of pinball machines — many loaned by Pinball Owner's Association members — and a fascinating interview with an ace Defender player, who regards the Swarms, Mutants and other nasties which inhabit this video game as sentient beings.

And finally a charming animated section at the end of the video film which depicts characters from pin table designs fighting it out with video-inspired aliens. £15 for 28 minutes.

THE SEA-SCAPE WITH A 3D FEEL

The third dimension is the current plaything which video game companies are flirting with.

Moving on from the 3D look of Zaxxon comes the 3D feel of Subroc-3D.

This space and sea warfare comes on a stand-up cabinet and a cockpit. Like Battle Zone you have to watch the game through a small binocular eye-panel which opens out onto the main screen.

You look out on a seascape filled with futuristic shipping fleets and a sky inhabited by

SUBROC-3D

flying saucers and speeding space ships.

The action appears to you as though you are looking through the cockpit of your Subroc fighter and the screen reacts to your tugs on two handles which pop out periscope-like from the eye-panel.

A fire button lets you reply to the barrage of fire which your ship is undergoing as all sorts of bombs and missiles are hurled towards you: torpedoes thread through the ocean while rockets fill the skies.

The ultimate challenge is the flying Command Ship with its awesome firepower and protective shields.

Stereo sound adds to the effect and so do changes in the skies to show day and night, dawn and dusk backdrops to the action. I found my initial response to be one of confusion, but Subroc-3D is undoubtedly the shape of games to come.

DUAL AERIAL DUELS

Take to the air on an ostrich, armed with a lance and battle with a band of buzzard-mounted evil-doers.

Joust takes place in a realm of sheer fantasy and its brand of peculiar aerial combat takes place between either one or two players and the machine.

Dual controls for the duellists encourage the two-player version as higher scores are possible when the players take part in tandem against each other and the machine itself.

Mounted on either an ostrich or a stork, each player mans a flap button and a joystick. He flies his bird towards the enemy riders and attempts to unseat them.

A successful Joust scores points and turns the enemy into

JOUST

an egg which must then be picked up before it hatches into an even more deadly opponent.

The Jousts take place between suspended outcrops of rock over which the combatants flap. Other features include a deadly pterodactyl which swoops down to engage the players; fire consumes the rock bridges leaving less space to land; and a lava troll takes shape, reaching up to grab anything which flies over its den.

The second, seventh, 12th — and so on — waves are termed Survival Waves where players are rewarded for not losing riders and every fifth wave is an egg wave with extra points to be won. Weird and wonderful.



GAPPING GUIDELINES

Outline encourages you to improve rapidly as you learn your way around its mazy courses.

Remember that the sparks travel at the same speed you do and when only one is on your trail there should be no problems if you keep moving. He can't catch you up and you can't get trapped anywhere.

Outline offers a joystick and a "gap" button as the controls. The joystick takes some getting used to because it needs constant pressure to keep moving. While the gap button should not be used for the first few screens as it only complicates matters.

Like all maze-games, once you have got a procedure for beating each screen, you should memorise it and stick with it.

Gapping breaks the line behind you but in corners it can lead to problems as you can gap yourself in behind two barriers. The gap lasts for several seconds before the diagram completes itself again.

It is possible to start at different levels in Outline but score and practice suggest it is best to start from the first level. This presents you with a "+" like shape and a single spark. Memorise the spark's early movements and learn just what to expect.

Flashing bonus scores can tempt you off your chosen path and into trouble but are worth three times the score.

The second screen "T" shape only threatens in the long central leg of the "T" where a careless player can get trapped.

The third diagram is the simplest, an "X" shape consists of five squares connected by one solitary line. The best method is to begin at a corner square and when the spark follows you up, leave with a gap behind you,

OUTLINE TIPS

stranding the spark in the corner.

The fourth diagram resembles a distorted "M" and the problems are increased by a second spark. These have a nasty habit of trying to trap you down one of the two long legs of the "M".

When sparks are after you, they tend to follow the "X" co-ordinate first, so a staggered pattern will often cause the spark to career along a horizontal line above you rather than following you down or up.

Another way to take advantage of the spark's no "U" turn policy is to follow behind it.

Wall five features a huge grid covering the whole screen with two sparks. The time bonus will often beat you on this wall.

If you do, then it's back to the "X" shape with two sparks and then onto a distorted "M" with two sparks which fire faster-moving missiles at you.

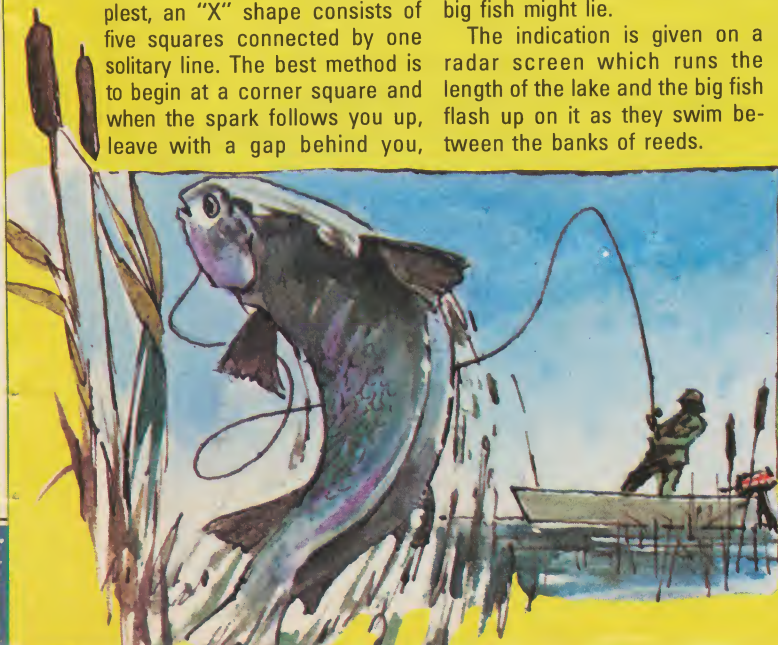
The game progresses through the missile firing screens onto invisible mazes which only show the scores, not the lines. At wall 13 you are introduced to the rocks which can hide you from the sparks and in the final wall, No. 20, a super fast spark adds to the problems.

A CAST OF MINNOWS

Angler Dangler gives every fisherman a chance to see the one that got away.

This fishing game sets you down on a bank with rod and line and a rough idea of where that big fish might lie.

The indication is given on a radar screen which runs the length of the lake and the big fish flash up on it as they swim between the banks of reeds.



QUEST FOR THE RED PLANET

GRAVITAR

You plot your own intergalactic course through Gravitar's deepest space in the quest for the Red Planet.

Your mission is to collect fuel from the minor planets in the solar system and then storm the Red Planet with its subterranean passages.

Gravitar is a new concept in lunar landing games as it shows you progressively closer pictures of your approach to the planet.

ANGLER DANGLER

A pointer moves swiftly up and down beside the radar screen and this represents the current length of your cast. By casting as the pointer passes over a fish, you should be able to deliver a hook to the best part of the lake.

The small size tiddlers are fast to react but you can give the larger specimens a better chance of being first onto your hook by pulling it towards him.

With a tiddler on your hook you may decide to cast again by losing the fish in the reeds.

But if you have attracted a real monster then the fight begins, steering him around any obstructions, watch the line tension as he fights and you reel in.

The landing of these large specimens can be quite hard, and you only have so many hooks...

In deep space your only worries are the Death Star — which will try to pull you into its field of gravity — and two pursuing craft sent after you by the Red Planet.

If one of these ships should come too close, the screen enlarges to allow you both to manoeuvre in a dogfight.

Arriving at a planet, you screen changes to show a close up of your craft descending. Soon the features of the planet are discernible. These include rocky mountainscapes usually studded with red bunkers which protect the blue fuel cells.

Taking care to avoid the bunkers' fire, you must manoeuvre over the fuel cell and switch on your tractor beam to fill up with fuel.

The tractor button doubles as a shield button to help you repel enemy fire but each time you use it or the thrust button, fuel is depleted.

Points are scored for successfully raiding a planet in the given time limit, destroying enemy bunkers, collecting fuel and shooting red ships.

The Red Planet challenges you to guide the ship down into a spiral cavern where a clock ticks down on a reactor. Having survived the tunnel journey you must blast the reactor and escape from the tunnel, all in under 23 seconds. If the mission is successfully completed you are taken through to another universe.

Gravitar resembles Asteroids in design and controls. With single lines representing planet surfaces, ships and planets. The controls are: buttons for left and right rotation, fire and thrust buttons and a dual purpose, shield/tractor beam button.

Take-off for far away places with strange sounding names at the controls of a giant Jumbo jet.

Will you be able to pilot the huge jet and land it safely? You'll

soon know once you've programmed in this flight simulation which will test your skills to the limit.

By gradually lowering your speed and altitude you have to

achieve a safe landing in five sequences. The computer will ask you for the relevant instructions on your run-in to the airstrip. Lowering your airspeed of altitude by too much will

cause the jet to stall.

Can you keep the jet and your passengers on the straight and narrow?

There are two skill levels and impressive graphics to enjoy.



Illustration: Jon Davis

AIRLINE PILOT

BY B. SUMMERHAYS

RUNS ON A SHARP MZ80K IN 32K

```

10 REM COPYRIGHT BY B.SUMMERHAYS 1982
11 REM WHITEWAYS MIDDLE SHEFFIELD 4
20 TI$="000000"
25 PRINT "G"
30 PRINT "0000000000" AIRLINE PILOT"
40 IF TI$="0000004" THEN GOTO 60
50 GOTO 25
60 PRINT "G"
61 PRINT "AIRLINE PILOT by B.S. "
70 PRINT "
80 PRINT "You are the pilot of a Jumbo jet."
90 PRINT "By gradually lowering speed and"
100 PRINT "altitude you must achieve a safe"
110 PRINT "landing in 5 sequences."
120 PRINT "Wind speed is added onto airspeed"
130 PRINT "in each sequence. A minus windspeed"
140 PRINT "denotes wind against and will slow"
150 PRINT "you down accordingly."
160 PRINT "LOWERING AIRSPEED OR ALTITUDE BY"
170 PRINT "TOO MUCH CAUSES A STALL OR A SPIN!"
180 A=INT(RND(10)*1000)+4000
190 PRINT "PRESS H FOR HARD GAME, N FOR NORMAL"
200 GET Z$
210 IF Z$="" THEN GOTO 280
220 IF Z$="H" THEN A=A+1000
230 TI$="000000"
240 D=40
250 W=INT(RND(10)*40)+20
260 X=INT(RND(10)*6)+1: IF X<3 THEN W=-W
270 F=INT(RND(10)*50)+200
280 S=INT(RND(10)*100)+400
290 PRINT "G"
300 PRINT "FLIGHT BA 103"
310 PRINT "
320 PRINT "
330 PRINT "
340 PRINT "
350 PRINT "
360 PRINT "
370 PRINT "
380 PRINT "
390 PRINT "
400 PRINT "
410 PRINT "
420 PRINT "
430 PRINT "
440 PRINT "
450 PRINT "
460 PRINT "
470 PRINT "
480 PRINT "
490 PRINT "
500 PRINT "
510 PRINT "
520 PRINT "
530 PRINT "
540 PRINT "
550 PRINT "
560 PRINT "
570 PRINT "
580 PRINT "
590 PRINT "
600 PRINT "
610 PRINT "
620 PRINT "
630 PRINT "
640 PRINT "
650 PRINT "
660 PRINT "
670 PRINT "
680 PRINT "
690 PRINT "
700 PRINT "
710 PRINT "
720 PRINT "
730 PRINT "
740 PRINT "
750 PRINT "
760 PRINT "
770 PRINT "
780 PRINT "
790 PRINT "
800 PRINT "
810 PRINT "
820 PRINT "
830 PRINT "
840 PRINT "
850 PRINT "
860 PRINT "
870 PRINT "
880 PRINT "
890 PRINT "
900 PRINT "
910 PRINT "
920 PRINT "
930 PRINT "
940 PRINT "
950 PRINT "
960 PRINT "
970 PRINT "
980 PRINT "
990 PRINT "

```

```

2120 IF C>1500 THEN PRINT "YOU ARE IN A SPIN" GOTO 7500
2130 A=A-C
2140 GOSUB 9000
2150 E=INT(RND(10)*10)+1
2160 IF E>6 THEN A=A+(E*100)
2170 IF E>6 THEN PRINT "SEVERE TURBULENCE YOU MUST"
ASCEND ":(E*100):FEET"
2180 PRINT "
2190 PRINT "
2200 PRINT "
2210 PRINT "
2220 PRINT "
2230 PRINT "
2240 PRINT "
2250 PRINT "
2260 PRINT "
2270 PRINT "DISTANCE 30 miles to runway"
2271 D=D-30
2280 PRINT "WIND SPEED":W:"knots"
2290 PRINT "FUEL LEFT ":F:"gallons"
2300 PRINT "AIRSPEED":S:"knots"
2310 PRINT "ALTITUDE":A:"feet"
2320 PRINT "DECREASE SPEED BY ? KNOTS":INPUT G
2330 S=S-G
2340 IF G>150 THEN PRINT "ENGINES STALLED" GOTO 7000
2350 H=INT(RND(10)*20)+1
2360 W=W+H
2370 S=S+H
2380 PRINT "DECREASE ALTITUDE BY ? FEET":INPUT J
2385 IF J>1500 THEN GOTO 7500
2390 A=A-J
2395 GOSUB 9000
2400 K=INT(RND(10)*10)+1
2410 IF K<5 THEN PRINT "YOU HAVE A FUEL LEAK, "
(K*10):"GALLONS LOST"
2420 IF K>5 THEN PRINT "YOUR HOSTESS HAS"
BROUGHT YOUR COFFEE"
2430 IF K<5 THEN F=F-(K*10)
2440 F=F-(K*8)
2450 IF F<1 THEN PRINT "NO FUEL LEFT":GOTO 8000
2460 PRINT "
2470 PRINT "
2480 PRINT "
2490 PRINT "
2500 PRINT "
2510 PRINT "
2520 PRINT "
2530 PRINT "
2540 PRINT "
2550 PRINT "
2560 PRINT "
2570 PRINT "
2580 PRINT "
2590 PRINT "
2600 PRINT "
2610 PRINT "
2620 PRINT "
2630 PRINT "
2640 PRINT "
2650 PRINT "
2660 PRINT "DISTANCE 20 miles"
2670 D=D-20
2680 W=W+K
2690 PRINT "WIND SPEED":W:"knots"

```




Don't bother guessing which programs our members are saving money on this month.

If you use a BBC, Dragon, Spectrum, VIC or ZX81 computer and you are not yet a member of THE MICROCOMPUTER SOFTWARE CLUB, then only those with the VIC can be forgiven. We have only just added the VIC to our coverage.

Membership of The Microcomputer Software Club would save you money and trouble. Each month we thoroughly test and evaluate the many programs issued by the growing number of producers - including Pixel, IJK, Bug-Byte, A & F, Campbell, C-Tech, and the smaller companies that you may find it difficult to keep track of. If a program is good, and it has got to be very good, it is recommended to our members in the next issue of the Newsletter.

All the programs that we recommend are made available to our members at very low prices. For example, a Bug-Byte program usually costing £10.00 would be offered to members at £9.00 or less. A saving of at least 10%. Every month we select what, in our opinion, is the overall best program for each computer and this MAIN CHOICE program is offered to members, for one month only, at an average 20% less than the normal price. A MAIN CHOICE program usually costing £6.00 would, therefore, be available to members at about £4.80.

Every month members receive, free of charge, our Newsletter full of information on the programs we have found suitable for recommendation. The range is large, including adventure, arcade, standard games, household, financial, educational, wordprocessing, and utilities. Ordering from the Newsletter is simple and quick and, of course, quality is guaranteed.

**JOIN THE CLUB
AND WE WILL
TELL YOU,
FOR FREE**

Membership is completely free of charge, and receipt of the Newsletter is automatic. Members are under no obligation to purchase a fixed number of programs from the Club. They buy what they want when they want in the full knowledge that they are buying the best programs at the best prices. So, if you own or use a BBC A or B, Dragon, Spectrum (both versions), VIC (expanded or unexpanded), or ZX81 (16k), join the Club. It will cost you nothing, and save you a lot.

JOIN TODAY

THE MICROCOMPUTER SOFTWARE CLUB
P.O.Box 166, Oxford, OX2 9BJ, England.

THE MicroComputer SOFTWARE CLUB

Free membership application

Please accept my application and enrol me as a member of The Microcomputer Software Club. I understand that membership is free of charge.

As a member I will receive the Club Newsletter free of charge and will be entitled to benefit from any savings offered to members on selected programs for microcomputers. I may cancel my membership at any time.

When completed, return form to:-

THE MICROCOMPUTER SOFTWARE CLUB
P.O.Box 166, Oxford, OX2 9BJ, England.

NAME

ADDRESS

CITY

POSTCODE

AGE (If under 18)

COMPUTER MODEL

COMPUTER RAM

SIGNATURE


```

2700 PRINT"FUEL LEFT";F;"gallons"
2710 PRINT"AIRSPEED";S;"knots"
2720 PRINT"ALTITUDE";A;"Feet"
2730 PRINT"DECREASE SPEED BY ? KNOTS":INPUTL
2740 S=S-L
2750 IFL>100THENPRINT"ENGINES STALLED"
2760 IFL>100THENGOTO7000
2770 IFS<50THENPRINT"ENGINES STALLED"
2780 IFS<50THENGOTO7000
2790 PRINT"DECREASE ALTITUDE BY ? FEET":INPUTM
2800 A=A-M
2810 IFA<500THEN GOTO 8000
2820 IF M>1200THENPRINT"YOU ARE IN A SPIN"
2830 IFM>1200THENGOTO7500
2840 F=F-(L/4)
2845 GOSUB9000
2850 N=INT(RND(10)*10)+1
2860 W=W+N
2870 O=N*100
2880 IFN>5THEN PRINT"HEAVY CLOUD;AUTO-PILOT LOSES YOU";O;"FEET OF ALTITUDE"
2890 IFN>5THENA=A-O
2900 IFN<3THENPRINT"FIRE IN NO.1 ENGINE, YOU LOSE AIRSPEED":FORV=1TO2000:NEXT
2910 IFN<3THENS=S-67
2920 IFS<60THENGOTO7000
2930 PRINT"PRESS ANY KEY FOR FINAL APPROACH"
2940 GETZ$
2950 IFZ$=""THENGOTO2940
2960 PRINT"@"
2970 PRINT"
2980 PRINT"
2990 PRINT"
3000 PRINT"
3010 PRINT"
3020 PRINT"
3030 PRINT"
3040 PRINT"
3050 PRINT"
3060 PRINT"DISTANCE, 10 miles to touchdown "
3070 D=10
3080 W=W-14
3090 PRINT"WIND SPEED";W;"knots"
3100 S=S-W
3110 PRINT"FUEL LEFT";F;"gallons"
3120 PRINT"AIRSPEED";S;"knots"
3130 PRINT"ALTITUDE";A;"Feet"
3140 PRINT"DECREASE SPEED BY ? KNOTS":INPUTP
3150 IFP>120THENGOTO7000
3160 S=S-P
3270 IFS<50THENGOTO7000
3280 PRINT"DECREASE ALTITUDE BY ? FEET":INPUTQ
3290 IFQ>1500 THENGOTO7500
3300 A=A-Q
3310 IFA<200THENGOTO7500
3320 F=F-(S/4)
3330 IFF<1THEN PRINT"NO FUEL LEFT"
3340 IFF<1THENGOTO7900
3345 GOSUB9000
3350 E=INT(RND(10)*10)+1
3360 W=W-E
3370 IFE<4THENPRINT"ELECTRIC STORM DETOUR COSTS 54 GALLONS OF FUEL"
3380 IFE<4THENF=F-54
3390 IFE>6THENA=A+500
3400 IFE=5THENPRINT"A HIJACKER HAS BLOWN A HOLE IN THE FUSELAGE"
3410 IFE=5THENFORV=1TO2000:NEXT
3411 IFE=5THENGOTO7500
3420 PRINT"PREPARE TO LAND,PRESS ANY KEY"
3430 GETZ$
3440 IFZ$=""THENGOTO3430
3450 PRINT"@"
3460 D=0
3470 PRINT"
3480 PRINT"
3490 PRINT"
3510 PRINT"
3520 PRINT"
3530 PRINT"
3540 PRINT"
3550 PRINT"
3560 PRINT"
3565 R=E*10
3570 PRINT"RUNWAY BELOW ,LANDING SPEED SHOULD BE ";R;"knots"
3580 PRINT"ACTUAL SPEED IS";S;"knots "
3590 PRINT"ALTITUDE SHOULD BE 0 FEET"
3595 D=0
3600 PRINT"ACTUAL ALTITUDE IS";A;"Feet"
3600 PRINT"ACTUAL ALTITUDE IS";A;"Feet"
3610 F=F-39
3620 PRINT"FUEL LEFT ";F;"gallons"
3630 IFF<1THENGOTO7900
3640 PRINT"DECREASE SPEED BY ? knots":INPUTT
3650 IFT>80THEN GOTO7000

```



```

3660 S=S-T
3670 IFS<>RTHENGOTO8000
3680 PRINT"DECREASE ALTITUDE BY ? FEET":INPUTU
3690 IFU>1000THENGOTO7500
3700 A=A-U
3800 IFA<>0THENGOTO8000
3850 GOSUB9000
3900 GOTO5000
5000 PRINT"E"
5010 PRINT""
5020 PRINT""
5030 PRINT""
5040 PRINT"        WELL DONE!!!!"
5050 PRINT"SSSA  SAFE LANDING"
5060 PRINT"V"
5070 PRINT" I"
5080 PRINT" I"
5090 PRINT" I"
5100 PRINT" I"
5110 PRINT" I"
5120 PRINT" I"

```

```

5140 PRINT"YOUR PILOT RATING IS ";TI#;"
      FAULTS.(000000 IS PERFECT)"
5150 PRINT"LESS THAN 000120 IS VERY GOOD"
5160 PRINT"ABOVE 000500 IS POOR"
5170 PRINT"ANOTHER FLIGHT?"
5180 GETZ#:IFZ#=""THEN GOTO5180
5190 IFZ#="Y"THENGOTO60
5200 IFZ#="N"THENGOTO10000
5230 GOTO10000
7000 PRINT"E"
7010 PRINT"SSSSSEMERGENCY!!!!"
7020 X=53248
7030 POKEX+410.05
7040 POKEX+411.14
7050 POKEX+412.07
7060 POKEX+413.09
7070 POKEX+414.14
7080 POKEX+415.05
7090 POKEX+416.19

```

Illustration: Jon Davis




```

7100 POKEX+417,64
7120 POKEX+418,19
7130 POKEX+419,20
7140 POKEX+420,01
7150 POKEX+421,12
7160 POKEX+422,12
7170 POKEX+423,05
7180 POKEX+424,04
7190 FORM=1T03000:NEXT
7200 GOTO7800
7490 PRINT"G"
7500 PRINT"G"
7501 PRINT"EMERGENCY!!!!"
7510 PRINTTAB(10);"RATE OF DESCENT TOO GREAT"
7520 PRINTTAB(15);"YOU ARE IN A SPIN "
7522 TEMP07
7523 MUSIC"BAFGFEDCBAGFEDCBAGFEDCBAGFEDCB"
7530 FORM=1T03000:NEXT
7800 PRINT"G"
7810 E=INT(RND(10)*8)+1
7811 PRINT"DO NOT PANIC!!!"
7815 PRINT"PANIC BUTTON"
7816 PRINT" "
7817 PRINT"ONE AND ONLY ONE OF THE NUMBER"
7818 PRINT"BUTTONS WILL SAVE YOU"
7819 PRINT"PRESS ONE NOW (1 TO 9)":INPUTZ
7830 PRINTZ
7840 IFZ=ETHENPRINT"YOU ARE BACK ON COURSE"
7845 IFZ=ETHENFORV=1T03000:NEXT
7850 IFZ=ETHEN A=4000
7855 IFZ=ETHENGOTO900
7860 IFZ<>ETHENPRINT"HARD LINES,IT WAS";E;"THIS TIME!"
7865 FORM=1T02000:NEXT
7870 GOTO8000
7900 PRINT"G"
7905 PRINT"NO FUEL LEFT"
7910 PRINT" "
7915 PRINT"DO NOT START READING ANY LONG BOOKS"
7916 PRINT"ALL POWER LOST,ALL ENGINES DEAD"
7920 FORM=1T03800:NEXT
8000 PRINT"G"
8010 Y=INT(RND(10)*4)+1
8020 IFY=1THENY$="INTO THE SEA"
8030 IFY=2THENY$="INTO A MOUNTAIN"
8040 IFY=3THENY$="INTO A SEWAGE WORKS"
8050 IFY=4THENY$="INTO A CONCRETE FACTORY"
8060 IFY=5THENY$="INTO A CUSTARD FACTORY"
8070 PRINT"DISASTER!!!"
8080 PRINT" "
8090 PRINT"YOU HAVE CRASHED ";Y$;" AND ITS A MESS."
8091 PRINT"To say the least!"
8092 TEMP06
8093 MUSIC"C6R2C4R1C4R1C6R1#D4R1D4R1D4R1C4R1C4_B4R1C6"
8100 PRINT"TRY AGAIN?"
8200 GETZ$:IFZ$=""THENGOTO8200
8300 IFZ$="Y"THEN GOTO 60
8350 GOTO10000
8375 PRINT"G"
9000 PRINT"G"
9010 PRINT"VIDEO SIMULATION-SIDE VIEW "
9020 PRINT" "
9030 PRINT" "
9031 PRINT" "
9032 PRINT" "
9033 PRINT" "
9034 PRINT" "
9035 PRINT" "
9036 PRINT" "
9037 PRINT" "
9038 PRINT" "
9039 PRINT" "
9050 PRINT" MTS " " " " "
9060 PRINT" RUNWAY SEA "
9070 E=53248
9075 USR(62)
9080 IFD<41THENPOKEE+315,196
9081 USR(62)
9090 IFD<31THENPOKEE+345,196
9091 USR(62)
9100 IFD<21THENPOKEE+380,196
9101 USR(62)
9200 IFD<11THENPOKEE+418,196
9201 USR(62)
9300 IFD<1THENPOKEE+495,196
9301 USR(62)
9350 FORM=1T04000:NEXT
9375 PRINT"G"
9400 RETURN
10000 PRINT"THANK YOU FOR FLYING WITH US,GOODBYE."
10010 PRINT"G"
10020 GOTO10000
10040 END

```


BY R. M. STEVENSON

Golf

RUNS ON A BBC MODEL B IN 32K

"Fore! Ah, hello old chap. Out for a spot of golf then eh? Wonderful sport, what! Lots of fresh air and exercise. But sometimes you will find yourself stuck in the office for an afternoon. Or the weather will be so absolutely foul you won't be able to even lift a club for days!

That's where these computer chappies come in useful. They've got golf off to a tee on the old micro. Jolly good when you can't get down to the links... oh, excuse me, jolly old ball seems to have got lodged in the branches of that pine tree. Bye for now!"

This program includes all the elements of the real game. Bunkers, greens, and even the dreaded "rough". You can tell the computer how many holes you wish to play and it sets up the course for you.

It will ask you which direction you wish to make your shot to the green, and how hard you wish to hit the ball. The direction is calculated from 0 to 12 as in the hands of a clock, and strength by inputting a value from 0-100 which will represent the distance the ball travels in yards.

If you get into the trees you incur a penalty shot. If you get stuck in the rough you will have to hit your ball four times as hard as normal. If you land in a bunker you'll need to adjust your hitting power up to five times more than normal.

Good luck, good hitting, and we'll see you back at the clubhouse!

The following alterations are required to run the program on a model A machine. Change line 10 and 110 to read MODE 4. Change line 115 to read COLONS immediately following them. Change line 270 to read COLOUR 1.

In line 1020 remove the COLOUR 0 statement and the colon immediately following it. Change the MODE 1 and COLOUR 2 statements in line 1340 to read MODE 4 and COLOUR 1 respectively.


```

10MODE1
20VDU23,255,24,60,126,60,24,24,24,24
30VDU23,254,153,219,90,60,60,24,24,24
40VDU23,253,90,255,126,124,62,126,255,102
50VDU23,252,28,60,124,12,12,12,12,12
60VDU23,250,126,129,189,161,161,189,129,126
70VDU23,251,0,0,0,24,60,60,24
80PRINTTAB(18)"GOLF"TAB(18)"-----":PRINT:PRINTTAB(5)CHR$(250)" R.M.STEPHENSON
(1982)"
90PRINTTAB(5,5)"Do you want instructions(Y/N)?"::A$=GET$:IFLEFT$(A$,1)<>"Y"TH
EN130
100GOSUB 1360
110MODE1
115COLOUR2
120PRINT:PRINT:PRINTTAB(5)::COLOUR3:PRINT"/ "":COLOUR2:PRINT"represents the
hole"TAB(5)::COLOUR3:PRINT""::COLOUR1:PRINT">"::COLOUR3:PRINT""::COLOUR2:PR
INT"represents a bunker"TAB(5)::COLOUR3:PRINT"/^ "":COLOUR2:PRINT"represents
the rough"
121PRINTTAB(5);
123COLOUR3:PRINT""::COLOUR131:COLOUR0:PRINT""::COLOUR3:COLOUR128:PRINT""::CO
LOUR2
125COLOUR128:PRINT" represents a tree"TAB(5)::COLOUR3:PRINT"/^ "":COLOUR2:PR
INT"represents your ball"
130RUF=0:BUNKER=0
150SH=0:COURSE=0
160SP$=""
180PRINT:PRINT:PRINTTAB(12):INPUT"HOW MANY HOLES DO YOU WISH TO PLAY ?"H
190FORCDE=1TOH
200VDU19,2,2,0,0,0
210COLOUR 130
220CLS
230PAR=RND(3)+2
240YARDS=RND(100)+PAR*50
250X=2:Y=5
260FORTREES=1TO7
270 COLOUR0
280A=RND(27)+5:B=RND(23)
290FORLM=0TORND(4):PRINTTAB(A+LM,B)""::IFRND(2)=1THENNEXTLM ELSE PRINTTAB(A+LM+
1,B+1)" "":NEXTLM
300FORLM=0TORND(6):PRINTTAB(A+LM,B+1)""::IFRND(2)=1THENNEXTLM ELSE PRINTTAB(A+
LM+1,B+1)" "":NEXTLM
310FORLM=0TORND(3):PRINTTAB(A+LM,B+2)""::IFRND(2)=1THENNEXTLM ELSE PRINTTAB(A+L
M+1,B+2)" "":NEXTLM
320NEXTTREES
330GOTO430
340COLOUR1
350FORBUNKER=1TO2
360V=RND(2):IFV=1THENV=GRY-RND(3)
370IFV=2THENV=GRY+RND(3)
380N=RND(2):IFN=1THENN=GRX-RND(3)
390IFN=2THENN=GRX+RND(3)
400PRINTTAB(N,V)"33"
410NEXTBUNKER
420GOTO480
430STRFACT=YARDS/40
440GRY=7:GRX=YARDS/STRFACT-5:GRY=GRY+RND(8)
450COLOUR1
460COLOUR3:PRINTTAB(GRX,GRY)"|"
470GOTO340
480COLOUR3
490GRA=GRX-3:GRB=GRY-2
500COLOUR3:PRINTTAB(GRX,GRY)"|"
510FORROUGH=1TO4
520COLOUR7
530W=RND(30):Q=RND(23)
540PRINTTAB(W,Q)"AAAA"
550PRINTTAB(W,Q+2)"^ ^^^"
560NEXTROUGH
570COLOUR3
580 COLOUR3:PRINTTAB(GRX,GRY)"|"
590MK=3:FOLLS=5TOGRY
600PRINTTAB(MK,LS)" "TAB(MK,LS-1)" "TAB(MK,LS-2)" "TAB(MK,LS+1)" "TAB(MK,LS+2)"
"
610MK=MK+1:NEXTLS
620FORKH=GRX-MK-1 TO GRX-7
630PRINTTAB(KH,GRY)" "TAB(KH,GRY-1)" "TAB(KH,GRY+1)" "
640NEXTKH
650REM****COURSE SET UP,NOW PRINT DETAILS AND INPUT MOVE
660COLOUR3
670PRINTTAB(X,Y)"C"
680COLOUR1
690IF COURSE=0 THEN A$="EVENS":GOTO720
700IF ABS(COURSE)<>COURSE THEN A$=STR$(ABS(COURSE))+ " UNDER"
710IF ABS(COURSE)=COURSE THEN A$=STR$(ABS(COURSE))+ " OVER"
720 COLOUR3:PRINTTAB(0,1)"PAR "":PAR;" "":YARDS;" YARDS";" "":COURSE PAR ":"A$;
TAB(2,27)"SHOTS "":SH'TAB(2)"HOLE "":COE'TAB(2)"COURSE LENGTH "":H;" HOLES"
730PRINTTAB(2,30)"DIRECTION (0 TO 12)";:INPUTANG
740IFANG>12 OR ANG<0.1 THENPRINTTAB(2,30)SP$:GOTO730
750PRINTTAB(2,30)SP$:TAB(2,30)"STRENGTH(0 TO 100)";:INPUTS
760IF RUF=1 THEN RUF=0:S=S/4
770IF BUNKER=1 THEN BUNKER=0:S=S/5

```




MYSTERIOUS ADVENTURES



FOR BBC MICROCOMPUTER MODELS A & B*

Join the growing band of Adventurers who are enjoying these absorbing and stimulating programs. Step into another world of Fantasy, Magic, Mystery and Sorcery. Only your wits and cunning can ensure success in these scenarios!



● WRITTEN IN
ULTRA-FAST
MACHINE CODE.

● SAVE GAME
FEATURE.

● SPLIT SCREEN
DISPLAY.

1. THE GOLDEN BATON — Venture into a strange province of Sorcery and Evil Magic to recover the Golden Baton, a priceless artifact whose powers are said to bring great Health and Prosperity to the Land.
2. THE TIME MACHINE — As a Newspaper reporter you are sent to investigate the eccentric professor who lives in the old house on the Moors. What is his secret and why is his house now deserted?
3. ARROW OF DEATH (Pt. 1) — A blight has fallen on your homelands, the Baton has become tarnished and now radiates a malevolent aura of Evil. Your mission is clear — trace the source of this Evil and destroy... or be destroyed. This is the first part of an Epic Adventure although each part can be played as a stand alone scenario.
4. ARROW OF DEATH (Pt. 2) — You now have the means to destroy your enemy... but you are far from home and this land is strange to you. Can you cope with the deadly perils which approach you and have you the strength to see your mission through to the final conflict?
5. ESCAPE FROM PULSAR 7 — Alone on a gigantic Space-Freighter... The rest of your crew have died horribly at the hands of a mutated Zoo-Specimen. Your only chance of escape is to reach the Frail Shuttlecraft. But the lurking Monster is hungry and you are the only food it has left...
6. CIRCUS — Your Car has run out of Petrol on a lonely road miles from habitation. As you trudge reluctantly down the road in search of help you are suddenly confronted by an amazing sight... in a nearby field is a Huge Circus tent! But this is no ordinary Circus as you will soon discover...
7. FEASIBILITY EXPERIMENT — Far across the gulfs of time and space, a dying race of super-intelligent beings search the Universe for a Hero to save their existence... At length their thoughts turn to planet Earth. You are chosen to be their saviour in a bizarre scenario where death is a mere thought away...

* Adventures 5, 6 and 7 require 32K RAM.

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```

780PRINTTAB(2,30)SP$
790IFS>100THENS=100
800S1=40/YARDS
810S=S*S1
820PRINTTAB(X,Y)" "
830ANG=ANG*(PI/6)
840X=X+S*SIN(ANG)
850Y=Y-S*COS(ANG)
860SH=SH+1
870IFX>39THENX=39
880IFX<0THENX=0
890IFY<0THENY=0
900IFY>25THENY=25
910A$=FNREADCH(X,Y)
920IF A$="I"THENGOTO970
930IF A$="T"THENGOTO990
940IF A$="A"THENGOTO1090
950IF A$="V"THENGOTO1150
960GOTO670
970TOT=PAR-SH
980COURSE=COURSE-TOT

```

```

990IFABS(COURSE)=COURSE THENA$=STR$(COURSE)+" OVER"
1000IF COURSE=0 THENA$="EVENS"
1010IFABS(COURSE)<>COURSE THENA$=STR$(ABS(COURSE))+" UNDER"
1020COLOUR0:PRINTTAB(5,15);"CONGRATULATIONS!YOU HOLED IT IN ";SH;"
ES YOU TO ";A$
1030FORA=1TO8000:NEXT
1040SH=0
1050IF H=1 OR H=0 THEN1270
1060CLS
1070PRINTTAB(0,30)SP$;TAB(0,31)SP$
1080IFCOE=H THEN1270 ELSE NEXT COE
1090PRINTTAB(0,30)"IN THE TREES - PENALTY SHOT"
1100SH=SH+1
1110PRINTTAB(X,Y)"C"
1120FORA=1TO8000:NEXTA
1130PRINTTAB(0,30)SP$
1140GOTO960
1150PRINTTAB(0,30)"IN THE ROUGH"
1160PRINTTAB(X,Y)"C"
1170FORA=1TO8000:NEXTA
1180PRINTTAB(0,30)SP$
1190RUF=1
1200GOTO960
1210PRINTTAB(0,30)"BUNKERED - A CHIP SHOT IS NEEDED"
1220PRINTTAB(X,Y)"C"
1230FORA=1TO10000:NEXTA
1240PRINTTAB(0,30)SP$
1250BUNKER=1
1260GOTO960
1270CLS
1280IFABS(COURSE)=COURSE THEN A$=STR$(COURSE)+" OVER FOR THE COURSE"
1290IFCOURSE=0THENA$="EVEN PAR FOR THE COURSE"
1300IF ABS(COURSE)<>COURSE THEN A$=STR$(ABS(COURSE))+" UNDER FOR THE COURSE"
1310MODE7:PRINT:PRINTTAB(14);CHR$(129);CHR$(141);"GOLF"TAB(14);CHR$(129);CHR$(
141);"GOLF"
1320PRINTTAB(15);CHR$(129);"-----"
1330PRINT:PRINT:PRINTCHR$(130);CHR$(141);"YOU ENDED UP ";A$;CHR$(130);CHR$(141
);"YOU ENDED UP ";A$
1340PRINT:PRINT:PRINTTAB(5)"ANOTHER GAME (Y/N)?"";A$=GET$;IFLEFT$(A$,1)="
N"THEN END ELSEPRINT:PRINTTAB(5)"DO YOU WANT INSTRUCTIONS(Y/N)?"";A$=GET$;IF A$=
"Y" THEN GOTO100 ELSE MODE1:COLOUR2:GOTO130
1350END
1360MODE7:PRINT:PRINTTAB(14);CHR$(129);CHR$(141);"GOLF"TAB(14);CHR$(129);CHR$(
141);"GOLF"
1370PRINTTAB(15);CHR$(129);"-----"
1380IS$="When the computer asks you for your 'DIRECTION', you must type in a
number between 0 and 12(as in hands of a clock)(decimals are allowed).
1390I2$="When it asks for strength, your input (0 to 100), represents how far
the ball will travel in yards, (but remember that the actual distance it travels
on the screen will be proportionate to the length of the hole),"
1400I3$="You must avoid the trees, because when they are hit, they cause you to
incur a penalty shot. Also to be avoided is the rough, as your hitting power is
severely reduced (you will need about four times normal hitting power),"
1410I4$="When in a bunker, you will need to hit the ball five times as hard as
usual."
1420FOR SY=1TO LEN(IS$):PRINT MID$(IS$,SY,1);;SOUND0,-10,1,1;FORA=1TO150:NEXTA;
NEXTSY;FORGR=1 TO LEN(I2$):PRINTMID$(I2$,GR,1);;SOUND0,-10,1,1;FORA=1TO150:NEXTA;
0:NEXTGR;NEXTNS:PRINT:PRINT:PRINTMID$(I3$,NS,1);;SOUND0,-10,1,1;FORA=1TO15
ORA=1TO150:NEXTA;NEXTNS
1440FORLX=1TO5000:NEXT:RETURN
1450END
1460DEF FNREADCH(X,Y)
1470X=INT(X):Y=INT(Y)
1480LOCAL AZ, LASTX, LASTY, C
1490LASTX=FOS
1500LASTY=VPOS
1510VDU31,X,Y
1520AZ=135
1530C=USR(&FFF4)
1540C=C AND &FFFF
1550C=C DIV &100
1560VDU31,LASTX,LASTY
1570= CHR$(C)

```

THAT TAK

BY STEPHEN SHAW

POMPEII

RUNS ON A T.I. 99/4 OR 99/4A IN 16K IN EXTENDED BASIC

In the ashes of Pompeii, the ancient Roman city devastated by a volcano, some gaming counters, in the shape of trussed up chickens, were found.

There appear to have been 15 counters in a set with Roman numerals I to XV on one side and the other blank. Historians think that they may have been used with a box with 12 compartments.

Stephen Shaw has delved back into history for this latest brain-teasing program — based on an adaptation of the ancient Roman game produced by Whittlecraft of Worcester.

Rules of the game are included as DATA statements in the program and, says Stephen, should be sufficient for play.

Program notes:

- 120: Reruns program in case of serious errors-eg, syntax errors. You are advised to insert this line ONLY when the program has proved to be running OK. Otherwise you miss the error messages!-
- 140: Warning messages are not displayed — the program will continue. BREAK is not totally disabled but can only be used when the machine is waiting for an input.
- 180: Defines characters 100-102 as the horizontal and vertical lines of the grid and the connecting points (102).
- 210: VALIDATE will only permit you to enter a Y or N. If you just press ENTER an N is assumed in this prog.
- 240: Draw 4 horizontal lines
- 250: Draw 5 vertical lines
- 270: Put a + in where they join.
- 280-300: Put the numbers 1-12 in the boxes
- 320: Display the counter numbers on the left hand side of screen
- 330-340: General screen information
- 350: CT (x,1)= numbered side of counter
CT (x,2)= blank side of counter
CTR (x,1)= result of throw
CTR(x,2)= has counter been thrown this round?
Both ctr(x,1) and ctr(x,2) are here set to record the result of the throw, which is then displayed.
(For other computers use CTR(X,1)=CT(etc) ::
CTR(X,2)=CTR(X,1) if you dont have multiple assignments)
- 360: Tells comp all compartments are free for use.
- 380: When necessary changes the player (P).

- 430: Checks to see if counter can be used
- 490: If only one counter is to be used checks to see if compartment can be used.
- 500: Tells computer the compartment has been used and deletes the compartment number from the screen. Arrays RR(n) and cc(n) contain the screen locations of the compartment number n.
- 620-630: Reset counters ONE & TWO as appropriate if they cannot be used.
- 660: Have all faceup counters been used (if so TOT=0).
- 680: Rethrow any counters which have not yet landed number up in this round.
- 700-720: Have NO counters landed face up this time? Then score . . . Scoring routine- total value of unused faceup counters goes to TOT while total value of unused compartments goes to TBX
- 790-800: If one score exceeds 100 and player 2 has just completed a round ((ensures no disadvantage to player 1)) then evaluate the scores.
- 820-870: Final scoring & evaluation
- 880: Run again — if you do not have RUN as a command then reset scores as shown and use GOTO 1080.
- 970: If thermal printer has been selected but is not connected or switched on, this line will send you to 1030 for a message and then you will go back to the initial selection of line 920. Otherwise life would be difficult! The error line is amended then in line 940.
- 1050: Ensures you do not have continuous scrolling-just one screen at a time.

Illustration: Dorian Cross



1=
2=
3=
4=
5=
6=
7=
8=
9=
10=
11=
12=
13=
14=
15=

1		3	4
5		7	8
9			12

SCORES:NEVERA 50
TERRY 0

PLAYING:TERRY

WHICH COUNTERS?
FIRST:4
SIGN? (+ - OR .) - & 1
ENTER ZERO TO TERMINATE
USE . IF ONLY ONE # IS USED

1=
2=
3=
4=
5=
6=
7=
8=
9=
10=
11=
12=
13=
14=
15=

1	2		4
5	6	7	
9	10		

SCORES:NEVERA 50
TERRY 44

PLAYING:NEVERA

WHICH COUNTERS?
FIRST:4
SIGN? (+ - OR .) + & 1
ENTER ZERO TO TERMINATE
USE . IF ONLY ONE # IS USED

```

100 REM
110 REM POMPEII - FOR 99/4
IN EXTENDED BASIC BY S
STEPHEN SHAW © 1982
120 ON ERROR 130
130 CALL CHAR(104,"FF80BE8888B88
OFF017D417D057D01FF")!SJS LOGO
140 ON WARNING NEXT :: ON BREAK
NEXT
150 CALL CLEAR :: RANDOMIZE :: D
IM CT(15,2),CTR(15,2),BX(12),RR(
12),CC(12)
160 DISPLAY AT(2,10):"POMPEII" :
: P=1
170 DISPLAY AT(4,1):"FOR 99/4 BY
STEPHEN SHAW"
180 CALL CHAR(100,RPT$("0",14)&"
FF"&RPT$("01",8)&RPT$("01",7)&"F
F")
190 CALL HCHAR(6,15,104):: CALL
HCHAR(7,15,105)
200 DISPLAY AT(18,1):"WOULD YOU
LIKE INSTRUCTIONS?" :: DISPLAY A
T(19,10):"Y/N"
210 ACCEPT AT(19,15)BEEP SIZE(1)
VALIDATE("YN"):A$
220 IF A$="Y" THEN 900 ELSE 1080
230 REM SET UP / PLAY FM 240
CONT FROM 340
240 CALL CLEAR :: FOR R=2 TO 11
STEP 3 :: CALL HCHAR(R,16,100,16
):: NEXT R
250 FOR V=15 TO 31 STEP 4 :: CAL
L VCHAR(3,V,101,9):: NEXT V
260 CALL HCHAR(1,12,104):: CALL
HCHAR(2,12,105)! LOGO
270 FOR R=5 TO 11 STEP 3 :: FOR
V=19 TO 31 STEP 4 :: CALL HCHAR(
R,V,102):: NEXT V :: NEXT R
280 FOR R=1 TO 4 :: CC(R)=13+4*R
:: RR(R)=4 :: CALL HCHAR(4,CC(R
)+1,R+48)
290 CC(R+4)=13+4*R :: RR(R+4)=7

```

```

:: CALL HCHAR(7,CC(R+4)+1,R+52)
300 CC(R+8)=13+4*R :: RR(R+8)=10
:: NEXT R :: CALL HCHAR(10,18,5
7):: CALL HCHAR(10,21,49):: CALL
HCHAR(10,22,48)
310 DISPLAY AT(10,23)SIZE(2):"11
" :: DISPLAY AT(10,27)SIZE(2):"1
2" ! BOARD DRAWN & NUMBERED
320 FOR X=1 TO 15 :: DISPLAY AT(
X,1)SIZE(3):USING "##=":X :: NEX
T X
330 DISPLAY AT(13,10):"SCORES:"&
P$(1):: DISPLAY AT(14,17):P$(2):
: DISPLAY AT(13,26):STR$(SCORE(1
)):: DISPLAY AT(14,26):STR$(SCOR
E(2))
340 DISPLAY AT(16,10):"PLAYING:"
350 FOR X=1 TO 15 :: CT(X,1)=X :
: CT(X,2)=0 :: CTR(X,1),CTR(X,2)
=CT(X,INT(RND*2+1)):: DISPLAY AT
(X,4)SIZE(2):USING "##=":CTR(X,1)
:: NEXT X
360 FOR X=1 TO 12 :: BX(X)=X ::
NEXT X
370 DISPLAY AT(21,1):"ENTER ZERO
TO TERMINATE"
380 IF TOT=0 THEN 390 :: CALL SO
UND(660,660,0):: P=P+1 :: IF P=3
THEN P=1 ! CONTINUE PLAY FROM H
ERE
390 DISPLAY AT(16,18)SIZE(10):P$
(P)
400 DISPLAY AT(24,1):"USE . IF O
NLY ONE # IS USED"
410 DISPLAY AT(18,1):"WHICH COUN
TERS?" :: DISPLAY AT(19,1)SIZE
(32):"FIRST:"
420 ACCEPT AT(19,7)BEEP VALIDATE
(DIGIT)SIZE(2):ONE :: IF ONE=0 T
HEN 640
425 IF ONE>15 THEN GOSUB 1130 ::
GOTO 410
430 IF CTR(ONE,1)<>ONE THEN DISP

```



```

LAY AT(19,1): "NOT AVAILABLE
" :: GOSUB 1130 :: GOTO 410
440 CTR(ONE,1)=0 :: DISPLAY AT(ONE,4)SIZE(2):USING "##":CTR(ONE,1)
450 DISPLAY AT(20,1): "SIGN? (+ - OR .)"
460 SG$="!" :: ACCEPT AT(20,20)BEEP SIZE(1)VALIDATE("+-."):SG$ :: IF SG$=" " OR SG$="" THEN 460
470 IF SG$="." AND ONE>12 THEN CALL HCHAR(20,1,32,32):: CTR(ONE,1)=CTR(ONE,2):: DISPLAY AT(ONE,4)SIZE(2):USING "##":ONE :: GOTO 410
480 IF SG$<> "." THEN 510
490 IF SG$="." AND BX(ONE)<>ONE THEN DISPLAY AT(19,1): "NOT AVAILABLE " :: GOSUB 620 :: GOSUB 1130 :: CALL HCHAR(20,1,32,32):: GOTO 410
500 IF SG$="." AND BX(ONE)=ONE THEN BX(ONE)=0 :: CALL HCHAR(RR(ONE),CC(ONE),32,2):: CALL HCHAR(20,1,32,32):: GOTO 410
510 IF SG$<> "+" AND SG$<> "-" THEN 410 ! SG$ NOW= + OR -
520 DISPLAY AT(20,22): "&" :: ACCEPT AT(20,24)SIZE(2)BEEP VALIDATE(DIGIT):TWO
530 IF TWO>15 OR CTR(TWO,1)<>TWO THEN DISPLAY AT(20,1): "NOT AVAILABLE " :: GOSUB 1130 :: CALL HCHAR(20,20,32,12):: GOTO 520
540 IF TWO=0 THEN CALL HCHAR(20,1,32,32):: GOSUB 620 :: GOTO 410
550 CTR(TWO,1)=0 :: DISPLAY AT(TWO,4)SIZE(2):USING "##":CTR(TWO,1)
560 IF SG$="+" THEN X=ONE+TWO :: IF X>12 THEN DISPLAY AT(20,1): "ONLY 12 BOXES!" :: GOSUB 620 :: GOSUB 630 :: GOTO 410
570 IF SG$="-" THEN X=ABS(ONE-TWO):: IF X>12 THEN GOSUB 620 :: GOSUB 630 :: GOTO 410
580 IF BX(X)<>X THEN GOSUB 630 :: GOSUB 620 :: DISPLAY AT(20,1): "NOT POSSIBLE " :: CALL HCHAR(20,1,32,32):: GOTO 410
590 BX(X)=0 :: CALL HCHAR(RR(X),CC(X),32,2):: CALL HCHAR(19,1,32,64)
600 GOTO 410
610 STOP
620 CTR(ONE,1)=CTR(ONE,2):: DISPLAY AT(ONE,4)SIZE(2):USING "##":ONE :: RETURN
630 CTR(TWO,1)=CTR(TWO,2):: DISPLAY AT(TWO,4)SIZE(2):USING "##":

```

```

TWO :: RETURN
640 REM END TURN (ALL USED OR GIVE UP IN DESPAIR !
650 TOT=0
660 FOR X=1 TO 15 :: TOT=TOT+CTR(X,1):: NEXT X
670 IF TOT<>0 THEN 750 !SCORE
680 FOR X=1 TO 15 :: IF CTR(X,2)=0 THEN CTR(X,1),CTR(X,2)=CTR(X,1)+NT(RND*2+1))
690 NEXT X
700 FOR X=1 TO 15 :: DISPLAY AT(X,4)SIZE(2):USING "##":CTR(X,1):: NEXT X :: TEST=0
710 FOR X=1 TO 15 :: TEST=CTR(X,1)+TEST :: NEXT X
720 IF TEST=0 THEN 750 ! PERFECT SCORE
730 GOTO 380 !CONTINUE SAME PLAYER
740 STOP
750 TBX=0 ! SCORE SECTION
760 FOR X=1 TO 12 :: TBX=TBX+BX(X):: NEXT X
770 SCORE(P)=SCORE(P)+TOT+TBX
780 DISPLAY AT(12+P,26):USING "##":STR$(TOT+TBX):: TOT=-1
790 IF SCORE(1)>100 OR SCORE(2)>100 THEN 800 ELSE 280
800 IF P=2 THEN 820 ELSE 280
810 STOP !****
820 CALL CLEAR :: IF SCORE(1)>SCORE(2) THEN P=1 ELSE P=2
830 PRINT
840 PRINT P$(P)&" SCORE "&STR$(SCORE(P))&" LOSES": :
850 P=P+1 :: IF P=3 THEN P=1
855 PRINT P$(P)&" SCORE "&STR$(SCORE(P))&" WINS": : :
860 PRINT "ANOTHER GAME? Y OR N" :: INPUT A$ :: IF A$="Y" THEN 80 ELSE IF A$<>"N" THEN 860
870 STOP
880 SCORE(1),SCORE(2)=0 :: RUN 1080
890 STOP
900 REM INSTRUCTIONS HERE
910 REM PRINTER/SCREEN
920 CALL CLEAR :: PRINT "POMPEII " :: "WOULD YOU LIKE THE (LONG) INSTRUCTIONS ON YOUR TV SCREEN,OR ON YOUR THERMAL PRINTER?"
930 PRINT "ENTER TV OR TP":
940 ON ERROR 230 :: INPUT A$ :: IF A$<>"TP" AND A$<>"TV" THEN 940
950 IF A$="TV" THEN 1040
960 REM A$="TP"-PRINTER-FIRST TEST!

```



```

970 ON ERROR 1030
980 OPEN #1:"TP,U,3.E":OUTPUT ::
FOR IN=1 TO 300 :: READ AS :: I
P AS="END" THEN 1020
990 PRINT #1:AS :: NEXT IN :: CA
LL CLEAR
1000 REM NO MORE
1010 REM
1020 CLOSE #1 :: CALL CLEAR :: O
N ERROR 230 :: GOTO 1080
1030 CALL SOUND(700,440,0) :: PRI
NT "CANNOT ACCESS PRINTER" :: EO
N IN=1 TO 300 :: NEXT IN :: RETU
RN
1040 CALL CLEAR :: FOR IN=1 TO 3
00 :: READ AS :: IF AS="END" THE
N
1050 IS IN AS=INT(IN/10) THEN PRI
NT "PRESS ENTER TO CONTINUE" ::
INPUT AS :: CALL CLEAR
1060 PRINT AS :: NEXT IN
1070 PER
1080 REM INPUT NAMES
1090 PRINT "PLAYERS NAMES:MAX 8
CHARS:"
1100 INPUT "PLAYER ONE:" :P$(1)::
IF LEN(P$(1))>8 THEN 1100
1110 INPUT "PLAYER TWO:" :P$(2)::
IF LEN(P$(2))>8 THEN 1110
1115 IF P=0 THEN P=1
1120 GOTO 230
1130 FOR COUNT=1 TO 700 :: NEXT
COUNT :: RETURN
1140 END
1150 DATA POMPEII,BY STEPHEN SHA
W,FOR TEXAS INSTRUMENTS 99/4,AND
99/4A,IN EXTENDED BASIC
1160 DATA "THIS GAME IS BASED ON
GAMING CHIPS FOUND AT POMPEII,&
IS COPYRIGHT BY,WHITTLECRAFT,
1170 DATA RULES FROM GAMES & PUZ
ZLES,OCTOBER 1977,,,,,
1180 DATA THE BASIC GAME IS AS F
OLLOWS,THERE IS A BOX WITH TWEL
VE COMPARTMENTS,AND FIFTEEN DOUB
LE SIDED,COUNTERS,WITH ONE SIDE I
BLANK AND
1190 DATA THE OTHER WITH A NUMBE
R,,THE FIRST PLAYER THROWS THE,1
5 COUNTERS AND MUST USE THE,NUMB
ERS ON THOSE THAT FALL
1200 DATA NUMBER UP IN ACCORDANC
E WITH,THE FOLLOWING RULES,,,,,
1210 DATA THE VALUE OF ONE COUNT
ER MAY,BE USED TO 'FILL' ONE,COM

```

```

PARTMENT,OR THE SUM OR DIFFERENC
E OF TWO COUNTERS MAY BE USED
1220 DATA WHEN(IF) ALL FACES UP
COUNTERS,ARE USED UP,THOSE WHICH I
NITALLY FELL,BLANK UP,ARE RETHR
OWN,AND PLAYER ONE CONTINUES
1230 DATA UNTIL HE CANNOT,SEE A
COUNTER OR NO COUNTER,FALLS FACE
UP,,,,
1240 DATA WHEN THE FIRST PLAYER
CANNOT,CONTINUE,THE TOTAL,VALUE
OF ALL FACES,UP COUNTERS,AND ALL
UNFILLED,COMPARTMENTS,IS ADDED
TO HIS
1250 DATA SCORE,OR LOW SCORE WIN
S,,PLAY EVALUATES IN THIS VERS
ION,WHEN AFTER THE SECOND PLAYER
FINISHES,PLAYING ONE PLAYER,SCOR
ES
1260 DATA OVER 100,,,,
1270 DATA IN COMPUTER PLAY,THE,C
OUNTERS WILL,APPEAR ON THE,LEFT
SIDE OF THE SCREEN,THE COMPARTME
NTS,ON THE,RIGHT
1280 DATA THE PLAYER PLAYING IS,
INDICATED,AND BOTH SCORES,,AT TH
E END OF A PLAYERS TURN,THE SCOR
E FOR THAT TURN IS,FIRST SHOWN
1290 DATA THEN THE TOTAL,,ENTRI
ES MADE WHICH ARE NOT,POSSIBLE WI
LL BE IGNORED,THERE IS NO PENALT
Y,,,,
1300 DATA ENTER THE NUMBER OF TH
E,FIRST COUNTER,THEN, IF ONLY ON
E IS TO BE,USED A,.-FULL STOP,
IF ANOTHER COUNTER IS TO BE
1310 DATA USED THEN ENTER A + OR
.-,FINALLY ENTER THE VALUE OF,TH
E SECOND COUNTER,,
1320 DATA EG THREE SEPARATE ENTR
IES-,WATCH FOR INPUT PROMPTS,,,,
,,,,
1330 DATA TO THROW AGAIN WHEN YO
U HAVE,USED ALL THE COUNTERS SHO
WN,OR IF YOU CANNOT USE THEM,ALL
ENTER A 0 (ZERO)
1340 DATA WATCH FOR 'PLAYING',IN
DICATOR AS THE COMPUTER,WILL AUT
OMATICALLY CHANGE,PLAYERS IF ALL
BLANKS ARE,THROWN,,,,GOOD LUCK
1350 DATA " ",,,,,,POMPEII,,FO
R TI99/4 BY STEPHEN SHAW,1982,IN
EXTENDED BASIC,,,END,END,END,EN
D
1360 END

```

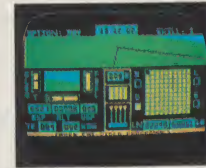

**“We will be flying at a height of 30,000 feet.
Our air speed will be 500 knots.
And there’s a fair chance we’re going to crash.”**





No smoking. Fasten your seat belt. You're about to take off in a 747. But on this flight you're the pilot.

You could hardly describe THORN EMI's 'Jumbo Jet Pilot' as simply another video game. It's more like a session in a flight simulator with life-like instrumentation and graphics.



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Escape from the Pyramids of Mars

```

1000 LET F=0
1010 GOSUB 9050
1020 LET H$="MINUTES"
1030 RAND
1040 LET PY=3
1050 LET PX=15
1060 LET A=1
1070 LET P$=" 0 "
1080 LET O=1
1090 LET O=0
1100 LET K=0
1110 LET A1=1
1120 LET A2=1
1130 LET A3=1
1140 LET A4=1
1150 LET T=240
1160 IF F=1 THEN GOTO 6670
1170 PRINT AT PY-1,PX;" "
1180 PRINT AT PY+1,PX+Q;" "
1190 PRINT AT PY,PX;P$
1200 GOSUB (INT (RAND*10)*10)+600
1210
1220 LET T=T-1
1230 IF T=0 THEN GOTO 6595
1240 LET PY1=PY
1250 LET PX1=PX
1260 IF INKEY$="5" THEN LET PX=PX-1
1270 IF INKEY$="6" THEN LET PY=PY+1
1280 IF INKEY$="7" THEN LET PY=PY-1
1290 IF INKEY$="8" THEN LET PX=PX+1
1300 LET G=3980+10*PY
1310 GOSUB G
1320 GOTO 3000
1330 IF PX<15 THEN LET PY=9
1340 IF PY<2 THEN LET PY=2
1350 IF PX=15 AND K=1 THEN GOTO 4700
1360 RETURN
1370 IF PX<=8 THEN LET PX=8
1380 IF PX>=22 THEN LET PX=22
1390 RETURN
1400 IF PX<=9 THEN LET PX=9
1410 IF PX>=21 THEN LET PX=21
1420 RETURN
1430 IF PX<=10 THEN LET PX=10
1440 IF PX>=20 THEN LET PX=20
1450 RETURN
1460 IF PX<=11 THEN LET PX=11
1470 IF PX>=19 THEN LET PX=19
1480 RETURN
1490 IF PX<=12 THEN LET PX=12
1500 IF PX>=18 THEN LET PX=18

```

Mars hides many secrets beneath its silent shifting sands. Was there a highly intelligent ancient race which existed on the planet in times long past?

You are a member of a team attempting to solve that mystery. You were on the verge of a great breakthrough after a mysterious pyramid was uncovered by excavations in one of the many Martian deserts — miles from the nearest earth colony. Your mission was to explore this newly unearthed structure.

But on entering you found yourself trapped in the interior of the pyramid. To escape you discovered that you needed four keys from the tomb's inner chamber. But you can only carry one key at a time due to a strange force which surrounds them.

The corridors and key chamber are protected by defence mechanisms still operational after millions of years. And your air supply is running out . . .

RUNS ON A ZX81 IN 16K

BY DAVID HEALEY

```

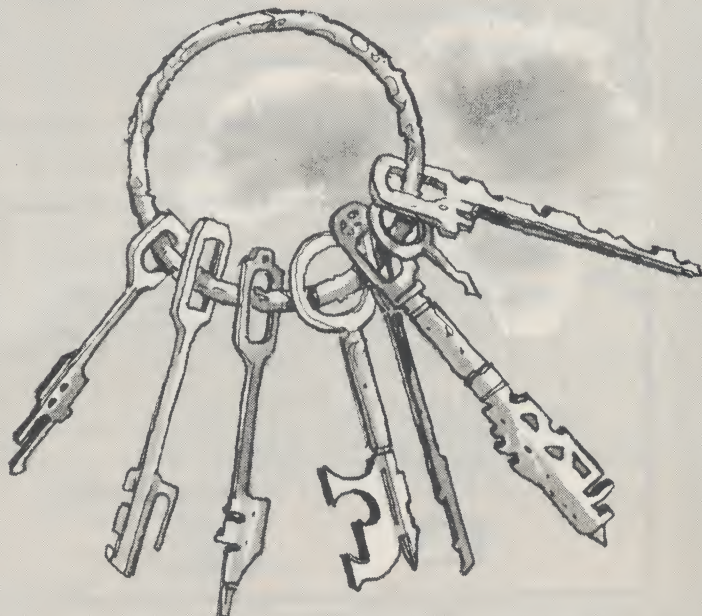
4054 RETURN
4060 IF PX<=13 THEN LET PX=13
4062 IF PX>=17 THEN LET PX=17
4064 RETURN
4070 IF PX<=14 THEN LET PX=14
4072 IF PX>=16 THEN LET PX=16
4074 RETURN
4080 IF PX<>15 THEN LET PX=15
4082 RETURN
4090 GOTO 4080
4100 GOTO 4060
4110 GOTO 4080
4115 GOTO 4080
4120 GOTO 4080
4130 GOTO 4080
4150 IF PY=17 AND PX<>15 THEN LE
T PY=PY1
4151 IF PY=17 AND PX<>15 THEN LE
T PX=PX1
4180 IF PY>18 THEN LET PY=18
4181 IF PY<18 AND PX<>15 THEN LE
T PY=18
4182 IF PX<2 THEN LET PX=2
4183 IF PX>28 THEN LET PX=28
4184 IF PX=9 AND A1=1 AND K=0 TH
EN GOTO 4500
4185 IF PX=21 AND A2=1 AND K=0 T
HEN GOTO 4510
4186 IF PX=26 AND A3=1 AND K=0 T
HEN GOTO 4520
4188 IF PX=4 AND A4=1 AND K=0 TH
EN GOTO 4530
4189 IF INKEY$="S" OR INKEY$="7"
AND PX<>15 THEN RETURN
4200 RETURN
4500 LET A1=0
4505 GOTO 4600
4510 LET A2=0
4515 GOTO 4600
4520 LET A3=0
4525 GOTO 4600
4530 LET A4=0
4535 GOTO 4600
4600 LET K=1
4610 LET P$=" "
4620 RETURN
4700 LET D=D+1
4710 PRINT AT 0,16;D
4720 LET P$=" "
4730 IF D=4 THEN GOTO 7000
4735 LET K=0
4740 RETURN
6000 PRINT AT 11,13;" ";AT 11,1
3;" "
6002 IF PY=11 THEN GOTO 6500
6003 RETURN
6010 PRINT AT 11,18;" ";AT 11,1
8;" "
6012 IF PY=11 THEN GOTO 6500
6013 RETURN
6020 PRINT AT 13,13;" ";AT 13,1
3;" "
6022 IF PY=13 THEN GOTO 6500
6023 RETURN
6030 PRINT AT 13,18;" ";AT 13,1
8;" "
6032 IF PY=13 THEN GOTO 6500
6033 RETURN
6040 PRINT AT 15,13;" ";AT 15,1
3;" "
6042 IF PY=15 THEN GOTO 6500
6043 RETURN
6050 PRINT AT 15,18;" ";AT 15,1
8;" "
6052 IF PY=15 THEN GOTO 6500
6053 RETURN
6060 PRINT AT 15,5;" ";AT 16,5;"
";AT 15,5;" ";AT 16,5;" "
6062 IF PX=4 THEN GOTO 6500
6063 RETURN
6070 PRINT AT 15,10;" ";AT 16,10
";AT 15,10;" ";AT 16,10;" "
6072 IF PX=9 THEN GOTO 6500
6073 RETURN
6080 PRINT AT 15,22;" ";AT 16,22
";AT 15,22;" ";AT 16,22;" "
6082 IF PX=21 THEN GOTO 6500
6083 RETURN
6090 PRINT AT 15,27;" ";AT 16,27
";AT 15,27;" ";AT 16,27;" "

```

```

6092 IF PX=26 THEN GOTO 6500
6093 RETURN
6098 FOR L=1 TO 30
6099 PRINT AT PY,PX;" ";AT PY,P
X;" ";AT PY,PX;" "
6500 NEXT L
6510 FOR L=1 TO 50
6520 NEXT L
6525 CLS
6530 PRINT "YOU HAVE BEEN ANNIHI
LATED BY THE"
6540 PRINT "PYRAMIDS SELF DEFENC
E MECHANISM"
6550 PRINT "GOOD JOB ITS ONLY A
GAME"
6555 PRINT
6570 PRINT "PRESS N/L FOR ANOTHE
R GAME"
6575 IF INKEY$="" THEN GOTO 6575
6577 LET F=1
6578 CLS
6580 GOTO 220
6585 LET F=0
6590 GOTO 9765
6595 CLS
6600 PRINT "YOU HAVE SUFFOCATED
THROUGH "
6610 PRINT "LACK OF OXYGEN. HARD
LUCK."
6620 PRINT
6630 PRINT "PRESS N/L FOR ANOTHE
R GAME."
6640 IF INKEY$="" THEN GOTO 6640
6642 LET F=1
6644 CLS
6650 GOTO 220
6660 LET F=0
6670 GOTO 9765
7000 CLS
7005 PRINT AT 6,16;" "
7010 PRINT AT 7,16;" "
7020 PRINT AT 8,14;" "
7030 PRINT AT 9,13;" "
7040 PRINT AT 10,12;" "
7050 PRINT AT 11,11;" "
7060 PRINT AT 12,10;" "
7070 PRINT AT 13,9;" "
7080 PRINT AT 14,8;" "
7090 PRINT AT 15,7;" "
7100 PRINT AT 16,6;" "
7110 PRINT AT 17,5;" "
7120 PRINT AT 18,4;" "
7130 PRINT AT 19,3;" "
7140 PRINT AT 20,2;" "
7150 FOR L=1 TO 10
7160 NEXT L
7300 PRINT AT 20,15;" "

```



Illustrations: Jon Davis

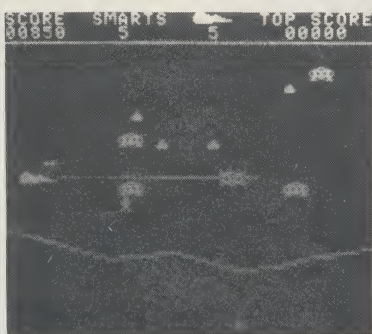


OMEGA MISSION £7

The first and only version of the superb Scramble Arcade game. Moving landscape! Fly over mountains, through caves and tunnels. 5 different stages. Ground to Air Missiles, Fire Balls, Space Craft, Mutants and the narrow twisting Tunnel. Movement in 8 directions, laser cannon. Excellent COLOUR graphics (give Black & White on monochrome T.V.) mode 3a, Sound Effects. Top score.

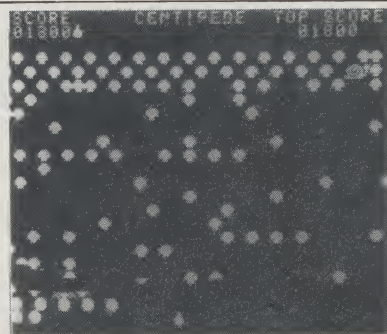
THE PROTECTOR £7

The most realistic version of this amazing Arcade game available for the Atom. Defend your humanoids from mutation and destroy the Aliens in this hyper fast, action packed game. Moving planetary surface, repeating lasers and smart bombs, thrust, sapce, increasing Attack Waves, 6 types of Aliens, Sound Effects. Top score and excellent mode 4 graphics are some of the features in this exciting game.



ATOM

ACTION PACKED M/CODE ARCADE GAMES

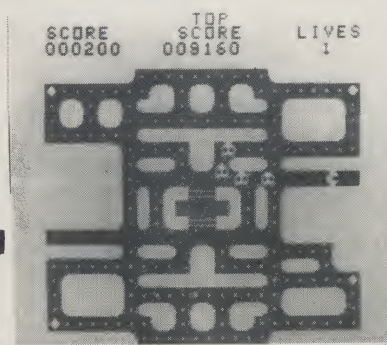


CENTIPEDE £6

The first and only version of this popular Arcade game for the Atom. Shoot down the splitting centipede as it swirls through the mushroom field. Also inhabiting the game are Spiders, Bugs and Snails. The action increases until only skill and quick thinking can save you. Excellent high speed mode 4 graphics. Sound Effects and Top score.

PUCKMAN £5

One of the best versions of this popular Arcade maze chaser game. Eat all the dots in the maze but watch out for the hungry ghosts! Eat an Energy Blob and the chase reverses. Each maze cleared brings a new one with faster ghosts. Excellent high speed mode 4 graphics, Sound Effects and Top score.



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```

7303 GOSUB 7400
7305 PRINT AT 20,15;" "
7310 GOSUB 7400
7320 PRINT AT 19,15;" "
7330 GOSUB 7400
7340 PRINT AT 19,15;" "
7350 GOSUB 7400
7360 PRINT AT 18,15;" "
7370 GOSUB 7400
7380 PRINT AT 18,15;" "
7395 GOSUB 7400
7397 GOTO 7450
7400 FOR L=1 TO 7
7410 NEXT L
7420 RETURN
7450 PRINT AT 20,17;" "
7460 PRINT AT 19,17;" "
7480 PRINT AT 18,17;" "
7490 PRINT AT 1,0;"YOU ESCAPED T
HE PYRAMID WITH "
7495 IF T=1 THEN LET H$="MINUTE"
7500 PRINT T;" ";H$;" OF OXYGEN
REMAINING"
7510 FOR L=1 TO 150
7520 NEXT L
7530 CLS
7540 PRINT "PRESS N/L FOR ANOTHE
R GAME."
7550 IF INKEY$="" THEN GOTO 7550
7555 CLS
7560 GOTO 1
9050 PRINT "
9055 PRINT "
9060 PRINT "
9065 PRINT "
9070 PRINT "
9075 PRINT "
9080 PRINT "
9085 PRINT "
9090 PRINT "
9095 PRINT "
9100 PRINT "
9110 PRINT "
9120 PRINT "
9130 PRINT "
9140 PRINT "
9150 PRINT "
9160 PRINT "
9170 PRINT "
9180 PRINT "
9190 PRINT "
9200 PRINT "
9210 PRINT "
9220 FOR A=0 TO 20 STEP 4
9230 PRINT AT A,22;"SYNACROOP"
9240 NEXT A
9250 FOR B=1 TO 21 STEP 4
9260 PRINT AT B,22;"SOFTWARE:"
9270 NEXT B
9280 FOR X=1 TO 150
9290 NEXT X
9300 FOR X=1 TO 22
9310 SCROLL
9320 NEXT X
9325 CLS
9330 PRINT "
9340 PRINT "
9350 PRINT "
9360 PRINT "
9370 PRINT "
9380 PRINT "
9390 PRINT "
9400 PRINT "
9410 PRINT " FROM THE
9420 PRINT
9430 PRINT
9440 PRINT
9450 PRINT
9460 PRINT
9470 PRINT
9480 PRINT "
9490 PRINT "
9500 PRINT "

```



```

9510 PRINT "
9520 FOR U=1 TO 150
9530 NEXT U
9540 CLS
9550 PRINT "
9570 PRINT " YOU ARE A MEMBER
OF A MARTIAN"
9580 PRINT "EXPLORATION PARTY AN
D HAVE"
9590 PRINT "EXCAVATED SEVERAL PY
RAMID"
9600 PRINT "STRUCTURES ON THE SU
RFACE OF "
9605 PRINT "MARS."
9610 PRINT " UPON ENTERING YOU
FIND "
9620 PRINT "YOURSELF TRAPPED IN
THE STRANGE"
9630 PRINT "INTERIOR OF THE PYRA
MID. TO "
9640 PRINT "ESCAPE YOU MUST COLL
ECT FOUR "
9650 PRINT "KEYS FROM THE INNER
CHAMBER "
9660 PRINT "CARRY THEM TO THE DO
OR AND"
9670 PRINT "PLACE THEM IN THE SL
OT. YOU CAN"
9680 PRINT "HOWEVER ONLY CARRY O
NE KEY AT A"
9690 PRINT "TIME."
9700 PRINT " THE CORRIDOR AND
KEYROOM ARE"
9710 PRINT "PROTECTED BY A DEFEN
CE MECHANISM"
9720 PRINT "WHICH CAN KILL YOU I
F YOU ARE"
9730 PRINT "CLOSE WHEN IT IS OPE
RATING."
9740 PRINT " REMEMBER THAT YOU
R OXYGEN "
9750 PRINT "SUPPLY IS LIMITED, S
O HURRY"
9755 PRINT "PRESS N/L TO CONTINU
E"
9760 IF INKEY$="" THEN GOTO 9760
9765 CLS
9770 PRINT "
9780 PRINT "
9790 PRINT AT 2,0;" ";AT 2
,25;" "
9800 PRINT AT 3,0;" ";AT
3,25;" "
9810 PRINT AT 4,0;" ";AT
4,24;" "
9820 PRINT AT 5,0;" ";A
T 5,23;" "
9830 PRINT AT 6,0;" ";
AT 6,22;" "
9840 PRINT "
9850 PRINT "
9860 PRINT "
9870 PRINT "
9880 PRINT "
9890 PRINT "
9900 PRINT "
9910 PRINT "
9920 PRINT "
9930 PRINT "
9940 PRINT "
9945 FOR V=17 TO 20
9950 PRINT AT V,0;" ";AT V,31;"
"
9955 NEXT V
9960 PRINT AT 20,4;" "
9965 PRINT "
9975 PRINT AT 19,5;" ";AT 19,10;"
";AT 19,22;" ";AT 19,27;" "
9980 RETURN
9990 SAVE "ONLY "
9999 GOTO 1

```


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TANKER

RUNS ON A SPECTRUM IN 16K

BY MIKE LEVER

A life on the ocean wave can be dangerous. There's always someone lurking around ready to blast your tanker right out of the water!

The object of this game is to knock out as many enemy tankers as possible using your anti-tanker gun — making sure that the vital supplies your warring opponent needs just don't get through.

To give those tanker captains that sinking feeling use keys "Z" to move left, "X" for right and "M" to fire.

```

10
EM These lines contain User
   Defined Graphics
20 REM
   1010, 1020, 1030, 1050,
   1120, 2010, and 9330

100 RANDOMIZE : GO SUB 9000: RE
M USR CHR$
110 GO SUB 9300: REM instr
120 GO SUB 8000: REM vars
130 GO SUB 8500: REM screen
140 FOR n=1 TO 3: FOR o=50 TO 0
0 STEP -5: BEEP .01,o: NEXT o: N
EXT n
150 REM Here we go!
1000 FOR a=1 TO 10
1010 PRINT AT 8,0: PAPER 6: INK
0:"G": PAUSE 5: PRINT AT 8,0: PA
PER 6: INK 0:"FG": PAUSE 5: PRIN
T AT 8,0: PAPER 6: INK 0:"EFG":
PAUSE 5
1020 FOR b=1 TO 29: BEEP .005,-1
5: PRINT AT 8,b-1: PAPER 6: INK
0:"EFG"
1030 PRINT AT 21,pos1: PAPER 1:"
":AT 21,pos: INK 7: PAPER 1:"A
B": LET pos1=pos: LET i=CODE INK
EY$: LET pos=pos+(i=120 AND pos<
27)-(i=122 AND pos>3): IF NOT i
THEN IF i=109 THEN LET f=1: LET
fp=pos: LET xfp=20: BEEP .01,30
1040 IF NOT f THEN GO TO 1100
1050 PRINT AT xfp+1,fp: PAPER 1:
" " AND xfp<>20:AT xfp,fp: INK
7:"CD": IF xfp=9 THEN GO TO 2000
1060 LET xfp=xfp-1: GO TO 1110
1100 FOR n=1 TO 4: NEXT n
1110 NEXT b
1120 PRINT AT 8,29: PAPER 6: INK
0:"EF": PAUSE 5: PRINT AT 8,30
: INK 0: PAPER 6:"E": PAUSE 5:
PRINT AT 8,31: PAPER 6:"": LET
a=a+1: GO SUB 8510
1140 FOR n=20 TO 40 STEP 10: BEE
P .1,n: NEXT n: NEXT a
1150 IF f THEN PRINT AT xfp+1,fp
: PAPER 1:" "
1160 FOR n=1 TO 100: NEXT n
1170 PRINT AT 12,11: INK 1:"GAME
OVER": INK 6: OVER 1: FOR x=10
0 TO 8 STEP -1: PLOT 0,x: DRAW 2
55,0: BEEP .005,x/2: NEXT x: OVE
R 0
1190 INK 2: PRINT AT 14,1: FLASH
1: PAPER 6:"PRESS ANY KEY FOR A
NOTHER GAME"
1200 IF INKEY$="" THEN FOR n=30
TO 50: BEEP .005,n: NEXT n: GO T
O 1200
1210 RUN 120
2000 IF fp<b OR fp>b+2 THEN LET
f=0: PRINT AT 9,fp: PAPER 1:" "
:GO TO 1110
2010 PRINT AT xfp,fp: PAPER 1:"
": FOR n=6 TO 10: FOR p=1 TO 5:
PRINT AT 8,b: PAPER 6: INK p:"E
FG": BEEP .01,n*p: NEXT p: NEXT
n: FOR n=40 TO 50: PRINT AT 8,b:
PAPER 6: INK 2: OVER 1:"HHH": B
EEP .01,n: PRINT AT 8,b: PAPER 6
: OVER 1:"": BEEP .01,55-n: N
EXT n: PRINT AT 8,b: PAPER 6:
": LET h=h+1: PAUSE 30: GO SUB
8510: LET f=0: GO TO 1140
8000 LET h=0: LET m=0
8010 LET pos=14: LET f=0: LET po
s1=pos
8020 LET no=INT (RND*15)+10
8400 RETURN
8500 BORDER 3: INK 7: PAPER 1: B
RIGHT 1: CLS : PRINT PAPER 3: FL
ASH 1:"*TANKER*": FLASH 0: BRI
GHT 0:"HITS: MISSES:
FOR x=1 TO 8: PRINT PAPER 6: N
EXT x: PRINT AT 21,0: PAPER 3: B
RIGHT 0: INK 1:"":AT 21,29:"
8510 PRINT AT 0,17: BRIGHT 0: PA
PER 3: INK 7:h:AT 0,28:m
8520 RETURN
9000 RESTORE 9100
9010 FOR x=0 TO 7
9020 FOR y=0 TO 7: READ z: POKE
USR (CHR$ (97+x))+y,z: NEXT y
9030 NEXT x
9040 RETURN
9100 DATA BIN 000000011,BIN 00000
011,BIN 000000011,BIN 000000011,BI
N 000000111,BIN 000111111,BIN 0111
111,255
9110 DATA BIN 11000000,BIN 11000
000,BIN 11000000,BIN 11000000,BI
N 11100000,BIN 11111000,BIN 1111
111,255
9120 DATA 0,1,1,1,3,1,3,0
9130 DATA 0,BIN 100000000,BIN 100
00000,BIN 100000000,BIN 11000000,
BIN 100000000,BIN 11000000,0
9140 DATA 0,BIN 00000100,BIN 000
00100,BIN 00000110,BIN 00001111,
BIN 01111111,BIN 00111111,BIN 00
011111
9150 DATA 0,0,0,0,BIN 10101000,2
55,255,255
9160 DATA 0,0,0,0,0,BIN 11111110
,BIN 11111100,BIN 11111000
9170 DATA 0,0,0,BIN 10010010,BIN
01010100,0,BIN 01010100,BIN 100
10010
9300 PAPER 0: INK 7: BRIGHT 1: B
ORDER 0: CLS
9310 PRINT INVERSE 1:" TANKER
by Mike Levers © 1982
9320 PRINT "The object of this
simple game is to knock out
as many enemy tankers as poss
ible using your anti-tanker
(GROAN!) gun."
9330 PRINT "Which looks like th
is: AB: To move your gun us
e key Z for left and X for ri
ght. To fire press M."
9340 PRINT "FLASH 1:" PRES
S ANY KEY TO BEGIN
9350 IF INKEY$="" THEN INK INT (
RND*4+4): OVER 1: FOR n=0 TO 19:
PRINT AT n,0: NEXT n: OVER 0:
GO TO 9350
9360 BEEP .5,10: RETURN

```


Let Commodore expand your horizons.

VIC 20 is the finest home computer that money can buy.

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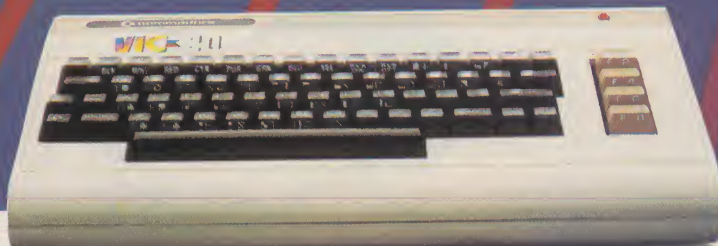
And 'home' software ranges from IQ tests to Robert Carrier menus.

In addition, there is a range of VIC software, like programmers' aids and graphics packages –

to add to your understanding and enjoyment of computers and computing.

There's even a special 'VicSoft' Club for VIC 20 enthusiasts, with many advantages including special offers to club members.





VCCVG 02/83



"Computerised scrumping! Whatever will they think of next? In my day we had to get out among the apple trees for a bit of fruity fun. And there was always the gamekeeper to keep an eye out for. If he caught you you'd know all about it! All these computerised chappies have to worry about is dropping apples!"

The game is set outside the tall ivy clad wall of an orchard. You are waiting at the bottom of the wall holding a basket on your head. Your computer "accomplice" will throw apples over the wall at random positions. All you have to do is catch as many as you can.

When you have caught 15 apples the game stops momentarily and the computer tells you it has found something to help you. A trestle is drawn on the screen and you hop up onto it. The game continues but you have less time to catch the falling apples.

The trestle drawing routine is continued each time you collect 15 apples in your basket, moving you progressively further up the screen, giving you less and less time to catch the falling fruit.

Once you have missed 10 apples the game stops and the computer tells you your score — a chance to have another crack at those apples!

Variables:

Y1: vertical position of basket.

Y: vertical position of man.

X1: horizontal position of basket and man.

APP: number of apples caught.

MISS: number of apples missed.

Q: limit of fall of apples in FOR/NEXT loop.

Z: determines level change (increase by 15 each level).

X: random horizontal position of falling apples.

L: control flag (equals 1 or 10).

The 'Y' character is a clear screen command (ESC. CTRL. CLEAR) and it appears in lines 10, 100, 2155.

Type line 2155 exactly as it is for correct screen format.

Lines 3050, 3070, 5100, 5130, 5140, 5160, 5340 should have the words between quotation marks typed in INVERSE video.

Also lines 5010-5070 should have the "s typed in alternate INVERSE video. In line 5250 type 21 CONTROL M's (underlining).




```

1 REM OVER THE ORCHARD WALL BY PETER & M
ARK WRIGHT AUGUST 1982.
3 GOSUB 5000
4 Q=79:Z=15
7 GOSUB 1000:GOTO 10
8 GOSUB 1002
10 ? "WE'VE GOT ";APP;" APPLES SO FAR"
15 IF APP>=15 THEN 750
20 POKE 704,52:POKE 705,218:COLOR 1:PLOT
0,15:DRAWTO 159,15
25 X=INT(RND(1)*120)+15:POKE 53278,0
29 REM MAIN PLAYING LOOP
30 FOR I=18 TO Q:B=STICK(0)
35 SOUND 0,I+11,10,8
40 COLOR 3:PLOT X,I:DRAWTO X+2,I:COLOR 0
:PLOT X,I-2:DRAWTO X+2,I-2
42 IF B=15 THEN POKE HPOSP0,X1:POKE HPOS
P1,X1:GOTO 50
44 IF B=11 AND X1>=67 THEN X1=X1-2:POKE
HPOSP0,X1:POKE HPOSP1,X1:SOUND 1,0,1,8:G
OTO 50
46 IF B=7 AND X1<=177 THEN X1=X1+2:POKE
HPOSP0,X1:POKE HPOSP1,X1:SOUND 1,0,1,8:G
OTO 50
50 IF PEEK(53252)<>0 THEN APP=APP+1:GOTO
600

```

```

0,60:DRAWTO 159,60
790 PLOT 20,60:DRAWTO 25,69:PLOT 20,60:D
RAWTO 15,69:PLOT 140,60:DRAWTO 145,69:PL
OT 140,60:DRAWTO 135,69
800 IF APP=30 THEN 20
810 COLOR 1:PLOT 0,51:DRAWTO 159,51:PLOT
0,50:DRAWTO 159,50
820 PLOT 20,50:DRAWTO 25,59:PLOT 20,50:D
RAWTO 15,59:PLOT 140,50:DRAWTO 145,59:PL
OT 140,50:DRAWTO 135,59
830 IF APP=45 THEN 20
840 COLOR 1:PLOT 0,41:DRAWTO 159,41:PLOT
0,40:DRAWTO 159,40
850 PLOT 20,40:DRAWTO 25,49:PLOT 20,40:D
RAWTO 15,49:PLOT 140,40:DRAWTO 145,49:PL
OT 140,40:DRAWTO 135,49
860 IF APP=60 THEN 20
870 COLOR 1:PLOT 0,31:DRAWTO 159,31:PLOT
0,30:DRAWTO 159,30
880 PLOT 20,30:DRAWTO 25,39:PLOT 20,30:D
RAWTO 15,39:PLOT 140,30:DRAWTO 145,39:PL
OT 140,30:DRAWTO 135,39
890 IF APP=75 THEN 20
900 GOTO 20
999 REM PLAYER/MISSILE GRAPHICS SET UP
1000 GRAPHICS 7:X1=125:Y=172:Y1=180

```

RUNS ON AN ATARI 400/800 IN 16K

over the orchard wall

BY PETER AND MARK WRIGHT

```

60 IF I=Q THEN MISS=MISS+1:IF MISS=10 TH
EN 3000
70 COLOR 1:IF I=Q THEN GOSUB 150
71 SOUND 1,0,0,0:NEXT I
74 REM CHECKS FOR NEXT LEVELS
75 IF APP=15 AND L=0 THEN ? "HOLD ON A M
INUTE, I'VE FOUND A PLANK":SOUND 0,0,0,0
:L=1:GOTO 100
80 IF APP=Z THEN ? "HOLD ON A MINUTE, I'
VE FOUND ANOTHER":? "PLANK":SOUND 0,0,0,
0:GOTO 100
90 GOTO 25
100 FOR I=1 TO 2000:NEXT I:Q=Q-10:Z=Z+15
:Y=Y-20:Y1=Y1-20: ? " ":GOTO 8
149 REM SOUND AND TEXT WINDOW INFORMATIO
N
150 FOR J=1 TO 5:SOUND 0,150,12,14:NEXT
J:FOR J=14 TO 0 STEP -1:SOUND 0,150,10,J
:NEXT J:RETURN
600 FOR N=I TO I-2 STEP -1:COLOR 0:PLOT
X,N:DRAWTO X+2,N:NEXT N:I=83:POKE 53278,
0
605 FOR J=1 TO 5:SOUND 0,40,10,14:NEXT J
:FOR J=14 TO 0 STEP -1:SOUND 0,40,10,J:N
EXT J
610 POKE 656,0: ? "WE'VE GOT ";APP;" SO F
AR, GREAT 'IN IT!!!!":GOTO 71
749 REM PLANK AND TRESTLE DRAWING ROUTIN
ES
750 COLOR 1:PLOT 0,71:DRAWTO 159,71:PLOT
0,70:DRAWTO 159,70
760 PLOT 20,70:DRAWTO 25,79:PLOT 20,70:D
RAWTO 15,79:PLOT 140,70:DRAWTO 145,79:PL
OT 140,70:DRAWTO 135,79
770 IF APP=15 THEN 20
780 COLOR 1:PLOT 0,61:DRAWTO 159,61:PLOT

```

```

1002 GRAPHICS 7+32:COLOR 1:SETCOLOR 2,12
,4:SETCOLOR 4,0,6:SETCOLOR 0,14,4:POKE 7
52,1:X1=125
1004 POKE 656,1:POKE 657,11: ? "HANG ON A
MINUTE!"
1005 POKE 704,6:POKE 705,6
1010 A=PEEK(106)-24:POKE 54279,A:PMBASE=
256*A
1020 POKE 559,62
1030 POKE 53277,3
1040 POKE HPOSP0,X1:POKE HPOSP1,X1
1050 FOR J=PMBASE+1024 TO PMBASE+1470:PO
KE J,0:NEXT J
1070 FOR J=PMBASE+1024+Y TO PMBASE+1032+
Y:READ A:POKE J,A:NEXT J
1080 DATA 255,255,255,255,126,126,126,12
6,60
1090 FOR I=PMBASE+1280+Y1 TO PMBASE+1290
+Y1:READ A:POKE I,A:NEXT I
1100 DATA 195,153,153,255,60,60,60,60,10
2,102,231
1110 POKE 623,1
1140 RESTORE
1999 REM PLAYFIELD SET UP
2000 SETCOLOR 1,9,8:COLOR 2:PLOT 159,13:
DRAWTO 159,0:DRAWTO 0,0
2010 POSITION 0,14:POKE 765,2:X10 18,#6,
0,0,"S:"
2015 COLOR 3:PLOT 4,14:DRAWTO 17,14
2020 PLOT 5,13:DRAWTO 15,13:PLOT 6,12:DR
AWTO 14,12:PLOT 9,11:DRAWTO 11,11:PLOT 1
0,10:DRAWTO 12,10
2030 COLOR 2:PLOT 7,13:PLOT 10,12
2035 COLOR 3:PLOT 47,14:DRAWTO 78,14:PLO
T 49,13:DRAWTO 77,13
2040 PLOT 50,12:DRAWTO 75,12:PLOT 53,11:

```




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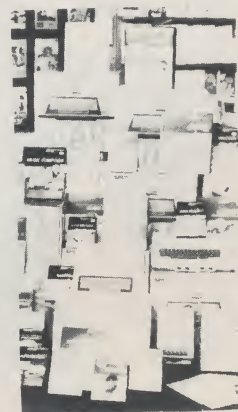
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```

DRAWTO 74,11:PLOT 58,10:DRAWTO 72,10
2050 PLOT 60,9:DRAWTO 71,9:PLOT 63,8:DRA
WTO 70,8:PLOT 64,7:DRAWTO 68,7:PLOT 65,6
: DRAWTO 68,6
2060 COLOR 2:PLOT 63,9:PLOT 70,9:PLOT 67
,6:PLOT 65,10:PLOT 72,11:PLOT 49,14:PLOT
49,14:PLOT 53,13:PLOT 58,13
2070 COLOR 3:PLOT 110,14:DRAWTO 125,14:P
LOT 112,13:DRAWTO 124,13:PLOT 115,12:DRA
WTO 123,12
2080 PLOT 118,11:DRAWTO 121,11:PLOT 119,
10:DRAWTO 121,10
2090 PLOT 140,14:DRAWTO 150,14:PLOT 141,
13:DRAWTO 148,13:PLOT 143,12:DRAWTO 148,
12:PLOT 146,11:DRAWTO 149,11
2100 PLOT 147,10:DRAWTO 150,10
2110 COLOR 2:PLOT 114,14:PLOT 123,14:PLD
T 114,13:PLOT 120,13:PLOT 119,12:PLOT 12
1,11:PLOT 144,13:PLOT 148,12
2120 PLOT 146,11:PLOT 142,14:IF L=1 THEN
RETURN
2130 COLOR 3:FOR I=15 TO 79:T=INT(RND(1)
*15):PLOT 0,I:DRAWTO T,I:NEXT I
2140 COLOR 2:PLOT 4,34:PLOT 7,76:PLOT 4,
18:PLOT 6,25
2150 COLOR 3:FOR I=15 TO 80:T=INT(RND(1)
*20)+140:PLOT 159,I:DRAWTO T,I:NEXT I
2155 ? "HERE WE ARE OUTSIDE THE ORCHARD
.IF YOU DROP 10 APPLES I'M NOT PLAYING "
2157 ? "PRESS RETURN WHEN YOU'RE READY";
:INPUT A$
2160 RETURN
2999 REM END ROUTINE
3000 POKE 656,0:POKE 657,0:? "
"
3002 ? "YOU'VE MISSED 10 APPLES":SOUND 0
,0,0,0:FOR I=1 TO 1000:NEXT I
3007 POKE HPOSP0,5:POKE HPOSP1,5
3010 GRAPHICS 2+16:SETCOLOR 1,9,8:? #6:?
#6
3020 ? #6;" you caught"
3030 POSITION 9,4:? #6:APP
3040 POSITION 7,6:? #6;"apples"
3050 POSITION 4,8:? #6;"ANOTHER GAME?"
3070 POSITION 6,9:? #6;"(y or n)"
3090 SETCOLOR 2,0,8:SETCOLOR 0,11,8
3100 FOR C=1 TO 50:NEXT C
3110 SETCOLOR 2,11,8:SETCOLOR 0,0,8
3120 FOR C=1 TO 50:NEXT C
3130 IF PEEK(764)=43 THEN POKE 764,255:A
PP=0:L=0:MISS=0:GOTO 4
3140 IF PEEK(764)=35 THEN 3160
3150 GOTO 3090
3160 GRAPHICS 2+16:SETCOLOR 0,7,8
3170 FOR I=0 TO 11:POSITION 2,I:? #6;"CH
ICKEN CHICKEN":SOUND 0,145+I*10,10,10

```

```

3180 FOR N=1 TO 50:NEXT N:SOUND 0,0,0,0:
NEXT I
3190 SOUND 0,0,0,0:GOTO 3190
4999 REM OPENING TITLES AND INSTRUCTIONS
5000 GRAPHICS 17:DIM A$(1):HPOSP0=53248:
HPOSP1=53249
5005 ? #6:? #6
5010 ? #6;" *****"
5020 ? #6;" * * "
5030 ? #6;" * over the * "
5040 ? #6;" * * "
5050 ? #6;" * orchard wall * "
5060 ? #6;" * * "
5070 ? #6;" *****"
5080 ? #6
5090 ? #6;" BY":? #6
5100 ? #6;"PETER & MARK WRIGHT"
5110 ? #6:? #6:? #6:? #6
5120 ? #6;
5130 ? #6;" do you require"
5140 ? #6;" instructions ?"
5150 ? #6
5160 ? #6;" (y or n)"
5170 SETCOLOR 2,15,8:SETCOLOR 0,11,8
5180 FOR J=1 TO 50:NEXT J
5190 SETCOLOR 0,15,8:SETCOLOR 2,11,8
5200 FOR J=1 TO 50:NEXT J
5210 IF PEEK(764)=43 THEN 5240
5220 IF PEEK(764)=35 THEN POKE 764,255:R
ETURN
5230 GOTO 5170
5240 POKE 764,255:GRAPHICS 0:SETCOLOR 2,
13,2:SETCOLOR 4,14,4
5250 ? :? "OVER THE ORCHARD WALL":? "<21
CTRL M>"
5260 ? "Young Albert Atari has managed t
o "?:? "climb the ivy clad orchard wall,
and"
5270 ? "has disappeared inside.":? :? "
He will throw the apples over the"
5280 ? "wall. You must try and catch as
many":? "as you can in the basket that A
lbert"
5290 ? "has provided.":? :? "(You can mo
ve left or right by using":? "a joystick
in the left hand socket)"
5300 ? :? " Every time you catch 15 ap
ples,":? "Young Albert will try and make
it"
5310 ? "easier for you?????":? :? " S
ee how many apples you can catch"
5320 ? "before Albert gets annoyed at th
e":? "number of apples you miss."
5330 ? :? "PRESS RETURN TO START GAME
"::INPUT A$
5340 RETURN

```



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FRUIT MACHINE

There's a one-armed monster which lurks in dark corners and is always ready to take your money. In return it could grant you vast riches — or a pocketful of fresh air. Yes, this is a game for all of you who like feeding those three-reeled bandits — and it won't cost you a penny! As this is a very long program for the unexpanded Vic-20 the instructions included are very brief — so for all of you with extra memory the first job is to type in some extra instructions.

When the insert coin sign shows press "I" then "f1" to run. "f7" shows your profit and losses. Now and again your Vic will present you with the chance to "gamble or collect" which could double or treble your winnings.

Any one or two reels can be "HELD" by pressing the corresponding number on the keyboard — "1, 2 or 3". In lines 800-865 certain graphic characters appear. These are merely shifted letters which will appear as upper case letters when the program is run.

Line 845 graphics are for the word "UP", line 847 for "DOWN" and line 849 for "BROKE EVEN". The two strange characters in lines 800 and 875 are a reversed "N" and a reversed "I". These are used to change the computer from upper to lower case and vice versa; they can be obtained by the following method.

Type the program line as shown but leave a space where this character is to appear and press return. Using the cursor control keys, position the cursor in the space you have left, press CTRL and RVS ON at the same time. Now press the key needed to produce the "f7" line 800 the key is "N". In line 875 it is "SHIFTED N". Now press return and continue with the program.

The symbol in line 104 is achieved by pressing the "f7" key (in quotes). Line 170 is "f1" in quotes, the listing was done on a Pet printer which does not have the "£" sign, so when you come to a "I" (in quotes) just press the "£" key.


```

1 C2$="#####":H$=CHR$(13):C3$="#####":CH$=H$+H$+C2$:SR=36875
2 SO=SR-3:DIMS$(15):Q=RND(-TI):CC$="#####":POKESR-1,15:GOTO20
3 S$(R)="":GOTO145
4 S$(R)="":GOTO145
5 S$(R)="":GOTO145
6 S$(R)="":GOTO145
7 S$(R)="":GOTO145
8 S$(R)="":GOTO145
9 S$(R)="":GOTO145
20 RN=1:GOSUB125
21 POKESR,13:PRINT"FRUIT MACHINE."
22 PRINT"##### 1 2 3 "
23 FM$="#####":PRINTFM$FM$
25 PRINT"#####H$FM$FM$
28 PRINT"##### 1 2 3 "
30 IFIS<1THENPRINT"INSERT COIN."
32 PRINT"#####PRESS F1"
35 PRINT"#####I=INSERT COIN (10P)H$F1=SPIN REELS"
40 PRINT"#####F7=CHECK PROGRESS":HA=1:GOSUB500
50 IFIS=1THEN115
100 POKE198,0
102 GETE$:IFE$=""THEN102
104 IFE$="I"THEN800
106 IFE$<>"I"THEN100
108 IN=IN+10:IS=2
115 PRINT"#####PRESS F1 "
125 FORR=1TO15
140 ONINT(RND(1)*23)+1GOTO3,4,5,6,7,8,9,3,4,5,6,7,8,6,3,4,5,8,8,3,4,3,4
145 IFR1THENRETURN
150 NEXT
155 IFRNTHENRETURN
160 P=0:K=INT(RND(1)*3)+1
165 IFK=2THENPRINTC3$:"#####HOLD#####HOLD#####HOLD#####
170 GETG$:IFG$=""THEN187
171 IFK<>2THEN170
172 IFG$="1"ANDR1=0THENR1=1:PRINTC3$:"#####HOLD":GOTO179
174 IFG$="2"ANDR2=0THENR2=1:PRINTC3$:"#####HOLD":GOTO179
176 IFG$="3"ANDR3=0THENR3=1:PRINTC3$:"#####HOLD":GOTO179
177 GOTO170
179 POKES0,200:FORI=1TO200:NEXT:POKES0,0:IFR1+R2+R3=3THENR1=0:R2=0:R3=0:K=2:GOTO165
182 GOTO170
187 PRINT"#####
190 CN=INT(RND(1)*20)+8
195 PRINT"#####
200 FORPZ=1TOCN
250 FORX=0TO10STEP5
260 IFR1ANDX=0THEN320
270 IFR2ANDX=5THEN320
280 IFR3ANDX=10THEN320

```

RUNS ON AN UNEXPANDED VIC-20

BY RICHARD LEYSHON

MICHAEL ORWIN'S ZX81 CASSETTES

The best software (by various authors) at low prices

QUOTES

"Michael Orwin's £5 Cassette Two is very good value. It contains 10 stolid well designed games which work, offer plenty of variety and choice, and are fun."

*from the ZX Software review
in Your Computer, May '82 issue.*

"I had your Invaders-React cassette . . . I was delighted with this first cassette."

P. Rubythor, London NW10

"I have been intending to write to you for some days to say how much I enjoy the games on 'Cassette One' which you supplied me with earlier this month."

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*Richard Ross-Langley,
Managing Director,
Mine of Information Ltd.*

CASSETTE 1

(eleven 1k programs)

machine code:

React, Invaders, Phantom aliens, Maze of death, Planet lander, Bouncing letters, Bug splat.

Basic:

IChing, Mastermind, Robots, Basic Hangman. PLUS Large screen versions of Invaders and Maze of Death, ready for when you get 16k.

Cassette 1 costs £3.80

CASSETTE 2

Ten games in Basic for 16k ZX81

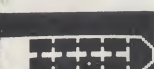
Cassette Two contains Reversi, Awari, Laser Bases, Word Mastermind, Rectangles, Crash, Roulette, Pontoon, Penny Shoot and Gun Command.

Cassette 2 costs £5.

CASSETTE 3

8 programs for 16k ZX81

STARSHIP TROJAN



Repair your Starship before disaster strikes. Hazards include asphyxiation, radiation, escaped biological specimens and plunging into a Supernova.

STARTREK This version of the well known space adventure game features variable Klingon mobility, and graphic photo torpedo tracking.

PRINCESS OF KRAAL

An adventure game.

BATTLE Strategy game for 1 to 4 players.

KALABRIASZ World's silliest card game, full of pointless complicated rules.

CUBE Rubik Cube simulator, with lots of functions including 'Backstep'.

SECRET MESSAGES This message coding program is very txlp qexi jf.

MARTIAN CRICKET A simple but addictive game (totally unlike Earth cricket) in machine code. The speed is variable, and its top speed is very fast.

Cassette 3 costs £5.

CASSETTE 4

8 games for 16k

ZX-SCRAMBLE (machine code)



Bomb and shoot your way through the fortified caves.

GUNFIGHT (machine code)



INVADERS (machine code)



FUNGALOID (machine code)

GALAXY INVADERS (machine code)
Fleets of swooping and diving alien craft.

SNAKEBITE (machine code)
Eat the snake before it eats you. Variable speed (very fast at top speed)

LIFE (machine code)
A ZX81 version of the well known game.

3D TIC-TAC-TOE (Basic)

Played on a 4x4x4 board, this is a game for the brain. It is very hard to beat the computer at it. 7 of the 8 games are in machine code, because this is much faster than Basic. (Some of these games were previously available from J. Steadman).

Cassette 4 costs £5.

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```

300 FOR Y=4 TO 1 STEP -1: S#(Y+X+1)=S#(Y+X): NEXT
310 R=X+1: RL=1: GOSUB 140
320 NEXT
500 PRINT CC#;: FOR I=1 TO 5: PRINT S#(I) " ";: NEXT
520 PRINT CC#; C2#;: FOR I=6 TO 10: PRINT S#(I) " ";: NEXT
540 PRINT CC#; C2#; C2#;: FOR I=11 TO 15: PRINT S#(I) " ";: NEXT: RN=0
550 IF P2 < 0 THEN NEXT
560 IF HATHENHA=0: RETURN
600 P2=7837: S1=PEEK(P2): S2=PEEK(P2+7): S3=PEEK(P2+14)
602 IF S1=42 AND S2=S1 AND S3=S1 THEN X=10000: GOTO 900
605 IF S1=90 AND S2=90 AND S3=90 THEN X=1500: GOTO 900
607 IF S1=90 AND S2=90 AND S3=42 THEN X=500: GOTO 900
610 IF S1=88 AND S2=S1 AND S3=S1 OR S1=94 AND S2=S1 AND S3=S1 THEN X=400: GOTO 900
615 IF S1=90 AND S2=S1 THEN X=350: GOTO 900
617 IF S1=83 AND S2=S1 AND S3=S1 THEN X=300: GOTO 900
620 IF S1=42 AND S2=S1 OR S2=42 AND S3=S2 THEN X=250: GOTO 900
630 IF S1=88 AND S2=S1 AND S3=42 OR S1=94 AND S2=S1 AND S3=42 THEN X=200: GOTO 900
640 IF S1=88 AND S2=S1 OR S2=88 AND S3=S2 THEN X=30: GOTO 900
650 IF S1=94 AND S2=S1 OR S2=94 AND S3=S2 THEN X=30: GOTO 900
660 IF S1=42 OR S2=42 OR S3=42 THEN X=10: GOTO 900
670 IF S1=S2 AND S2=S3 THEN X=20: GOTO 900
700 R1=0: R2=0: R3=0: IS=IS-1: IF IS<1 AND P THEN 21
710 IF IS<1 THEN 30
712 IF P THEN 21
720 GOTO 115
800 POKER, 90: PRINT "YOU HAVE PUT INTO ME"
805 IF IN<91 THEN PRINT H#; IN; "IF": GOTO 820
810 PRINT "IN/100;: IF IN/100=INT(IN/100) THEN PRINT ".00": GOTO 820
815 PRINT "
820 PRINT H#; "YOU HAVE WON BACK": H#
830 IF OT<91 THEN PRINT OT; "IF": GOTO 845
840 PRINT "OT/100;: IF OT/100=INT(OT/100) THEN PRINT ".00": GOTO 845
842 PRINT "
845 IF OT>IN THEN PRINT "YOU ARE 1/100": GOTO 855
847 IF OT<IN THEN PRINT "YOU ARE 10/100": GOTO 855
849 PRINT H#; "YOU HAVE 1/100": GOTO 860
855 R=ABS(IN-OT): IF R<91 THEN PRINT H#; R; "IF": GOTO 860
857 PRINT H#; "R/100;: IF R/100=INT(R/100) THEN PRINT ".00": GOTO 860
858 PRINT "
860 PRINT H#; "PRESS 1-4 TO CONTINUE"
865 PRINT "ANY OTHER KEY TO END"
867 POKE 198, 0
870 GETB#: IF B#="" THEN 870
875 IF B#="C" THEN PRINT "C": GOTO 21
880 SYS 0
900 FORA=1 TO 25: FORB=185 TO 240 STEP 2: POKES0, B: NEXTB: POKES0, 0
910 FORB=1 TO 30: NEXTB, A: POKES0, 0: POKE 198, 0
920 PRINT "WANT TO GAMBLE OR COLLECT?"
930 GETG#: IF G#="" THEN G#="C" AND G#="C" THEN 930
935 PRINT "
940 IF G#="C" THEN OT=OT+X: X=A: GOTO 700
960 POKER, 234: PRINT "CH# NOTHING CH# EVEN CH# NOTHING CH# DOUBLE"
970 PRINT H# C2# "NOTHING CH# TREBLE"
980 W=7819: FOR SD=1 TO INT(RND(1)*25)+5: POKEW, PEEK(W)+128: FOR I=1 TO 100: NEXT
990 POKEW, PEEK(W)-128: W=W+44: IF W>8058 THEN W=7819
1000 NEXT: POKEW, PEEK(W)+128
1010 IF PEEK(W)=133 THEN OT=OT+X
1020 IF PEEK(W)=132 THEN OT=OT+2*X
1030 IF PEEK(W)=148 THEN OT=OT+3*X
1040 FOR I=1 TO 30000: NEXT: X=0: P=1: GOTO 700

```


RUNS ON A DRAGON

IN 32K

BY A. CHAPMAN

MISSILE

```

10 REM*****MISSILE COMMAND*****
20 REM*****BY*****
30 REM*****A. CHAPMAN*****
50 DIM C$(7)
60 HI=0
70 DIM A(20),B(20),C(4),M(3),M1(3)
80 R=5:NI=1
90 S=0
100 FOR N=1 TO 250 STEP 10: SOUND N,1:NEXT N
110 C(1)=0:C(2)=0:C(3)=0:C(4)=0
120 K=0:FOR N=1 TO 4:IF C(N)=1 THEN K=K+1:NEXT N
130 IF K=4 THEN 780
140 FOR N=1 TO 250 STEP 10: SOUND N,1:NEXT N
150 A1=127:B1=91:A=127:B=91:M(1)=3:M(2)=3:M(3)=3
160 FOR N=1 TO NI:B(N)=1:A(N)=RND(256)-1:NEXT N
170 PMODE 1,1:SCREEN 1,0:PCLS1
180 *****set up screen*****
190 LINE(0,180)-(255,192),PSET,BF
200 C$="U"
210 C$(1)="C4BM32,180;E10;F10":C$(2)="C4
BM117,180;E10;F10":C$(3)="C4;BM202,18
0;E10;F10"
220 C$(4)="C4;BM61,180;U8;R20;D8":C$(5)
="C4;BM91,180;U8;R20;D8":C$(6)="C4;BM1
46,180;U8;R20;D8":C$(7)="C4;BM177,180;U8;R20;D8"
230 FOR N=4 TO 7
240 IF C(N)=1 THEN 260
250 DRAW C$(N)
260 NEXT N
270 DRAW C$(1):DRAW C$(2):DRAW C$(3)
280 FOR N=1 TO NI:IF A(N)=-1 THEN 310
290 PSET(A(N),B(N)):B(N)=B(N)+1
:A(N)=A(N)+RND(2)-RND(2)
300 IF A(N)<0 THEN A(N)=0
305 IF A(N)>255 THEN A(N)=255
310 NEXT N
320 B$=INKEY$

```

THE cities of planet Tanith are peaceful places with some of the most beautiful buildings in any city of the Sol system. But that peace will soon be shattered and the graceful sky towers will soon be burning — unless you can halt the deadly rain of missiles heading toward the planet from the depths of space where a hostile power is lurking...

This game for the new Dragon is an adaptation of the video favourite. It's got all the features of the arcade game and should test even the best Missile Commanders.

Line the oncoming missiles up in the sights of your anti-missile laser and blast away. Don't let any get through to destroy your planet's cities.

Use keys 1, 2 and 3 to fire and keys U-up, H-left, J-right, N-down to move your laser-sight.

Variables

C\$(N): contains information for drawing bases and cities.

HI: high score.

A(N),B(N): x,y co-ordinates of missiles.

C(N): whether city destroyed (1) or built (0).

A,B,A1,B1: position of laser-sight.

M(N): number of missiles in base N.

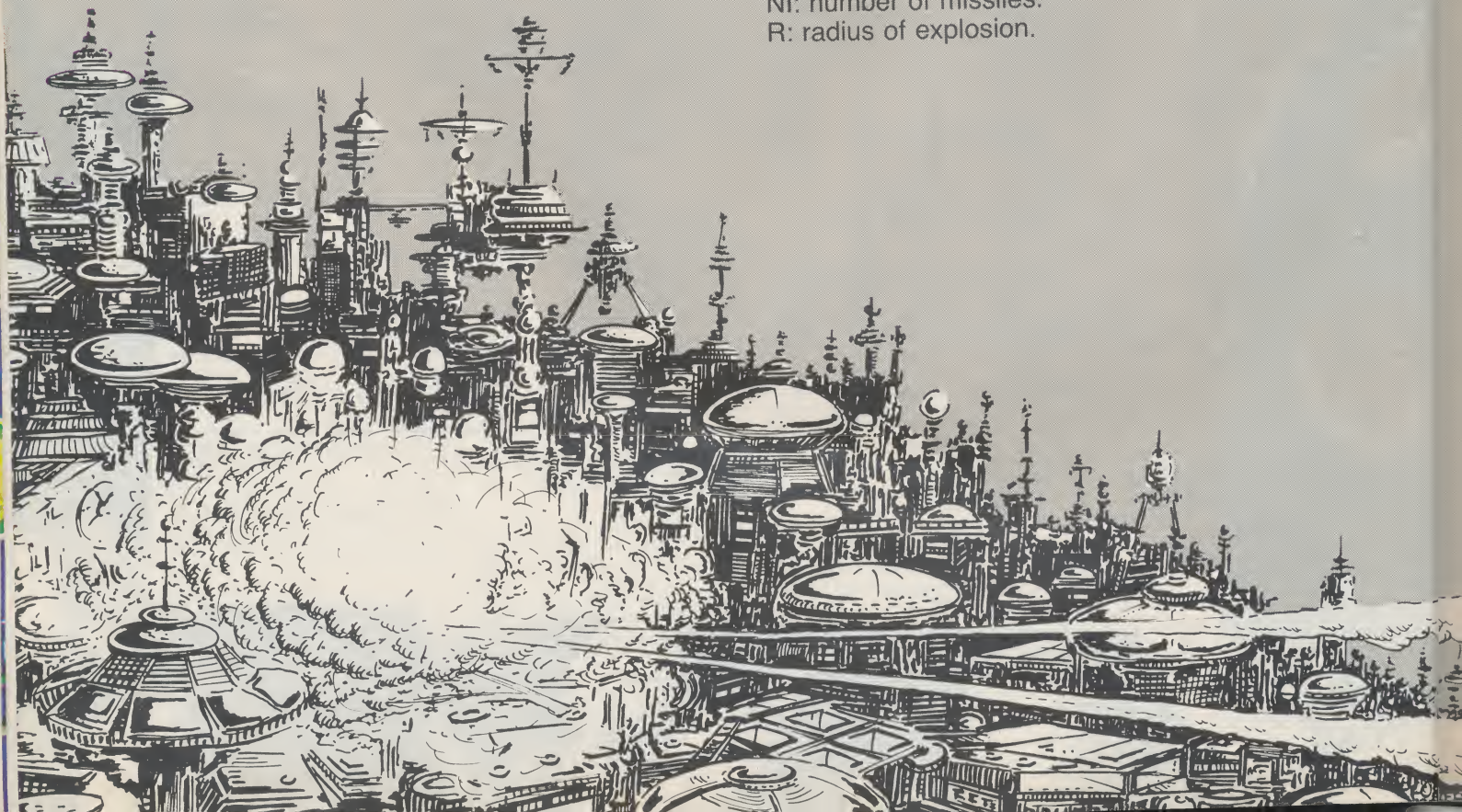
M1(N): x co-ordinates of top of bases.

B\$,C\$: movement.

S: score.

NI: number of missiles.

R: radius of explosion.



COMMAND

```

330 IF B$="J"OR B$="H"OR B$="U"OR B$="N"THEN 350
340 B$=C$
350 C$=B$
360 IF B$="J"THEN A=A+5:IF A>255 THEN A=255
370 IF B$="H"THEN A=A-5:IF A<0 THEN A=0
380 IF B$="N"THEN B=B+5:IF B>170 THEN B=170
390 PSET(A1,B1,1)
400 PSET(A,B,2)
410 A1=A:B1=B
420 SOUND 155,1
430 IF B$="U"THEN B=B-5:IF B<10 THEN B=10
440 A$=INKEY$:IF A$="1"OR A$="2"OR A$="3"THEN 500
450 FOR N=1 TO NI:IF A(N)=-1 THEN 490
460 IF B(N)<170 THEN 490
470 IF B(N)>190 THEN A(N)=-1
480 GOSUB 570
490 NEXT N:GOTO 640
500 U=VAL(A$):IF M(U)=0 THEN 450
510 SOUND 200,5
520 M(U)=M(U)+1
530 LINE(M1(U),170)-(A,B),PSET:CIRCLE(A,B),R,2
540 FOR N=1 TO NI:IF A(N)=-1 THEN 560

```

```

550 P=POINT(A(N),B(N)):IF P=2 THEN S=S+10:A(N)=-1
560 NEXT N:CIRCLE(A,B),R,1:LINE(M1(U),170)-(A,B),PSET:GOTO 450
570 IF A(N)>30 AND A(N)<54 THEN M(1)=0:DRAW"C1;BM32,180;E10;F10":A(N)=-1:RETURN
580 IF A(N)>58 AND A(N)<82 THEN C(1)=1:DRAW"C1;BM61,180;U8;R20;D8":A(N)=-1:RETURN
590 IF A(N)>88 AND A(N)<112 THEN C(2)=1:DRAW"C1;BM91,180;U8;R20;D8":A(N)=-1:RETURN
600 IF A(N)>116 AND A(N)<141 THEN M(2)=0:DRAW"C1;BM117,180;E10;F10":A(N)=-1:RETURN
610 IF A(N)>143 AND A(N)<167 THEN C(3)=1:DRAW"C1;BM146,180;U8;R20;D8":A(N)=-1:RETURN
620 IF A(N)>174 AND A(N)<198 THEN C(4)=1:DRAW"C1;BM177,180;U8;R20;D8":A(N)=-1:RETURN
630 IF A(N)>199 AND A(N)<223 THEN M(3)=0:DRAW"C1;BM202,180;E10;F10":A(N)=-1:RETURN
635 RETURN

```

```

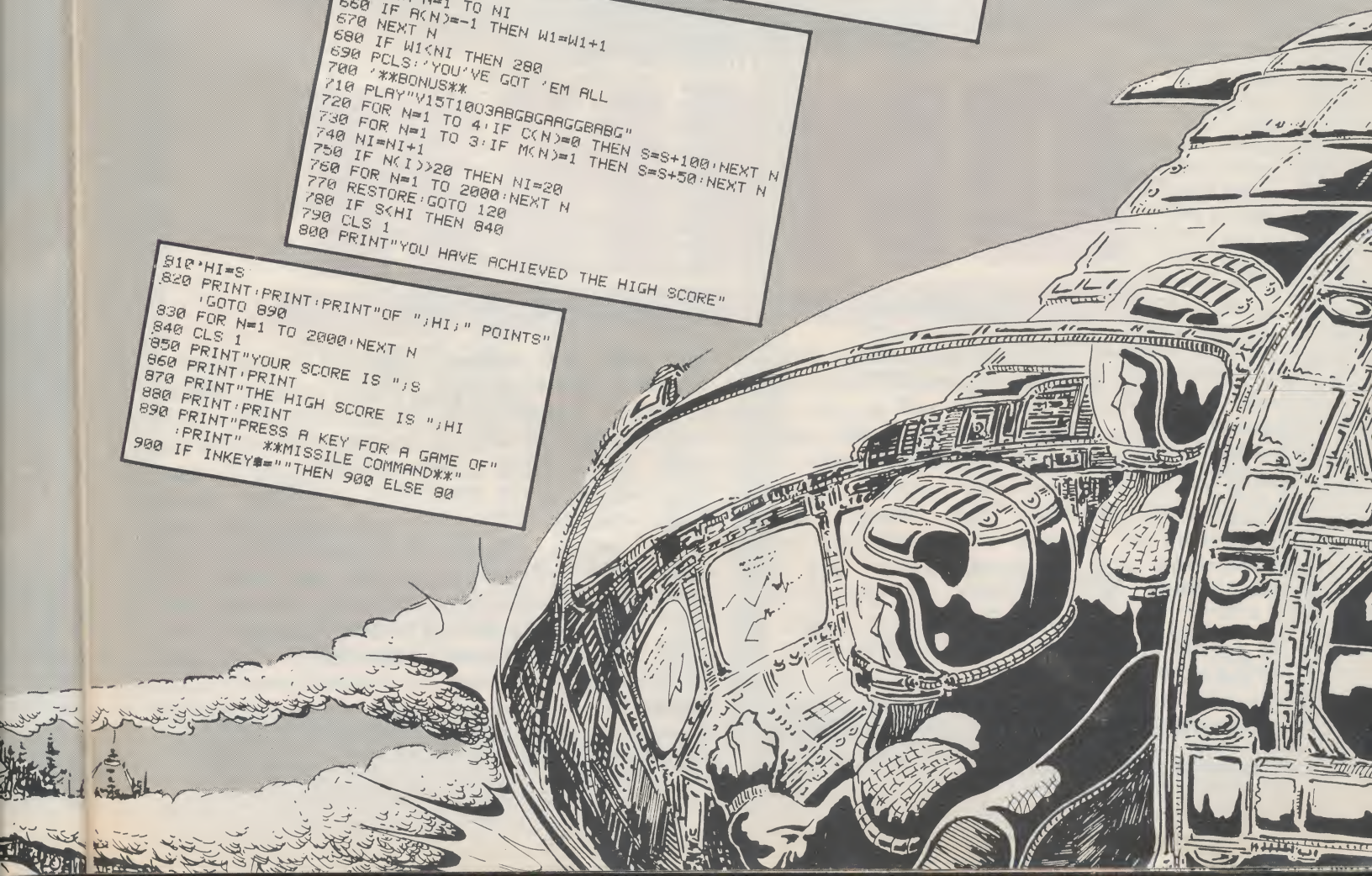
640 W1=0
650 FOR N=1 TO NI
660 IF A(N)=-1 THEN W1=W1+1
670 NEXT N
680 IF W1<NI THEN 280
690 PCLS:"YOU'VE GOT 'EM ALL
700 **BONUS**
710 PLAY"V15T1003ABGBGAGGBABG"
720 FOR N=1 TO 4:IF C(N)=0 THEN S=S+100:NEXT N
730 FOR N=1 TO 3:IF M(N)=1 THEN S=S+50:NEXT N
740 NI=NI+1
750 IF NI>20 THEN NI=20
760 FOR N=1 TO 2000:NEXT N
770 RESTORE:GOTO 120
780 IF S<HI THEN 840
790 CLS 1
800 PRINT"YOU HAVE ACHIEVED THE HIGH SCORE"

```

```

810 HI=S
820 PRINT:PRINT:PRINT"OF ";HI;" POINTS"
830 GOTO 890
840 FOR N=1 TO 2000:NEXT N
850 CLS 1
860 PRINT"YOUR SCORE IS ";S
870 PRINT:PRINT
880 PRINT"THE HIGH SCORE IS ";HI
890 PRINT:PRINT
900 PRINT"PRESS A KEY FOR A GAME OF"
910 PRINT" **MISSILE COMMAND**"
920 IF INKEY$=""THEN 900 ELSE 80

```




```

1DIMMK(10),VV(10),DD(10),
T(11),RR(2),P(-1)
2P.$21
3C
4:RRISTX#80;RTS
5:RRQJSR#FFE3
6LDX#10
7:RR2CMPT,X;BEQRR1
8DEX;BPLRR2;BMIRRO
9RTS
10J
11P.$6
12$T="ZXCASDQWE"
15S=#8000
16N=1
17GOS.i
18$IN."HOW MANY TREES
<1-200)",0;IFO>200;O=200
19P.$12;?#E1=0
20F.J=1T00
30X=A.R.%480+32
35IFS?X=255;G.30
40S?X=255
50N.
60S!60=#40404040
70S!92=#40884040
80S!124=#40404040
90S!416=#40404040
100S!448=#40404040
110S!480=#40404040
111X=480
120F.I=1T010;VV(I)
=0;DD(I)=0;MM(I)=0;N.
1210=0
140F.I=1TON
142R=A.R.%447+32
144IFS?R=255;G.142
146VV(I)=R;N.I

```

```

560S?K=32;S?Y=18;R=Y
565VV(I)=R
570N.I
600G.150
1000rU=D%32;V=D/32
1030A=A.(U-E);B=A.(V-G);C=A*A+B*B
1040IFC<Z;Z=C;Y=D
1050R.
1500WS!(X-2)=#00010817
1510F.J=0T05000;N.
1520P.$12
1530P."PRESS A KEY TO GO AGAIN";LI.#FFE3
1550G.s
2000P.$12,"YOU RESIGN!"
2010P."PRESS ANY KEY TO GO AGAIN";LI.#FFE3;G.s
3000IFS?(X+31)=255;R.
3010IFX%32=00RX/32>=15;R.

```

```

147IFN=1;P."THERE IS 1 RHINO";G.149
148P."THERE ARE ",N," RHINOS"
149P.$30;F.J=0T05000;N.
150P."your",#128,"90
152LI.RR0
154P."",#30
155W=?#80
160GOS.<2000+W*1000>
250S?X=15
252IFX=94;G.15000
3000=0
305F.I=1TON
310IFDD(I)=1;G.325
315R=VV(I)
317U=R%32;V=R/32;E=X%32;G=X/32
320IFUK>E;IFV>G;IFA.(U-E)<X>A.(V-G);G.325
321K=32*SGN(G-V)+SGN(E-U)
322F.J=R TO X S.K
323IFS?J=255;J=X;N.J;G.325
324N.J;DD(I)=1;Q=1;S?R=18
325N.I
330IFQ>0;G.150
350F.I=1TON
355IFDD(I)=0;G.570
360R=VV(I)
365MM(1)=S?(R+31)
370MM(2)=S?(R+32)
375MM(3)=S?(R+33)
380MM(4)=S?(R-1)
385MM(6)=S?(R+1)
390MM(7)=S?(R-33)
395MM(8)=S?(R-32)
400MM(9)=S?(R-31)
405IFMM(4)=255;IFMM(8)=255;MM(7)=255
410IFMM(8)=255;IFMM(6)=255;MM(9)=255
415IFMM(6)=255;IFMM(2)=255;MM(3)=255
420IFMM(2)=255;IFMM(4)=255;MM(1)=255
425K=R;Y=R
430U=R%32;V=R/32;E=X%32;G=X/32
435A=A.(U-E);B=A.(V-G);Z=A*A+B*B
439L=0
440F.J=32T0-32S.-32
450F.M=-1T01
455L=L+1
460IFMML=2550RMML=1360RMML=18;G.n
470D=R+J+M;IFA.(D%32-R%32)
=310RD<320RD>511;G.n
480IFMML=15;M=1;J=-32;I=N;N.;N.;G.W
490GOS.r
500nN.;N.

```

```

3020S?X=32;X=X+31
3030R.
4000IFS?(X+32)=255;R.
4010IFX/32>=15;R.
4020S?X=32;X=X+32
4030R.
5000IFS?(X+33)=255;R.
5010IFX%32=310RX/32>=15;R.
5020S?X=32;X=X+33
5030R.
6000IFS?(X-1)=255;R.
6010IFX%32=0;R.
6020S?X=32;X=X-1
6030R.
7000R.

```

```

8000IFS?(X+1)=255;R.
8010IFX%32=31;R.
8020S?X=32;X=X+1
8030R.
9000IFS?(X-33)=255;R.
9010IFX%32=00RX/32=1;R.
9020S?X=32;X=X-33
9030R.
10000IFS?(X-32)=255;R.
10010IFX/32=1;R.
10020S?X=32;X=X-32
10030R.
11000IFS?(X-31)=255;R.
11010IFX%32=310RX/32=1;R.
11020S?X=32;X=X-31
11030R.

```

```

15000P.$12,"PHEW,MADE IT!"
15010P."PRESS A KEY TO GO AGAIN";LI.#FFE3
15030N=N+1;IFN>10;N=10
15040G.s
16000iP.$12"YOU(O) ARE STRANDED IN RHINO"
16020P."COUNTRY.YOUR ONLY HOPE IS TO"
16030P."REACH THE SANCTUARY OF A HUT(h)"
16040P."SITUATED IN A CLEARING ON THE"
16050P."FAR SIDE OF THE TREES(#223).""
16060P."ONCE YOU ARE IN A DIRECT LINE"
16070P."WITH A HIDDEN RHINO (EITHER"
16080P."HORIZONTAL,VERTICAL OR DIAGONAL)"
16090P."AND PROVIDING THERE ARE NO"
16100P."INTERVENING TREES,IT WILL APPEAR"
16110P."AND PROCEED TO CHASE YOU.""
16120P."FORTUNATELY,THE RHINOS CAN MOVE"
16130P."NO FASTER THAN YOU AND,BEING"
16140P."BULKY,ARE UNABLE TO FOLLOW YOU"
16150P."DIAGONALLY BETWEEN TREES.""
16160P."press"#128"a"#128"key";LI.#FFE3
16170P.$12"TO MAKE YOUR MOVE,USE THE KEYS"
16180P."AROUND THE 'S'.YOU CAN RESIGN"
16190P."FROM A CHASE AT ANY TIME BY"
16200P."PRESSING THE SPACEBAR.NO OTHER"
16210P."KEYS ARE RECOGNISED.""
16220P."SHOULD YOU SUCCEED IN REACHING"
16230P."SAFETY,THE NUMBER OF RHINOS"
16240P."WILL BE INCREASED BY ONE,UP TO A"
16250P."MAXIMUM OF TEN,YOU MAY CHOOSE"
16260P."THE NUMBER OF TREES YOU WANT.""
16270P."THE MORE YOU HAVE,THE EASIER THE"
16280P."GAME."
16290R.

```




RHINO

RUNS ON AN ATOM IN 12K BY R. M. ANDREWS

"Out here in the bush us big game hunters have to live by our wits and our trusty elephant guns. Things can get really nasty — and more often than not — they do! Did I ever tell you about the time I was trapped out in the open in Rhino country? That was a tough one I can tell you. Dozens of the brutes came running at me as I made a

beeline for that old poachers hut down in the clearing. Luckily I managed to keep dodging through the trees and none of them got me. But, by jove, it was close!"

Now you can relive our hunter's exciting adventure. You are stranded in the bush and your only hope is to reach the sanctuary of a hut situated in a

clearing on the far side of some trees. Once you are in a direct line with a hidden rhino, and providing there are no intervening trees the horned beast will appear and proceed to chase you.

Fortunately for you the rhinos cannot run any faster than you and being big and bulky are unable to follow you diagonally through the

trees. Should you succeed in reaching the hut unmolested the number of rhinos will be increased by one — up to a maximum of 10. You may choose the number of trees you want. The more there are the easier the game.

Full instructions on how to deal with a runaway Rhino are included in the program.

Illustration: Terry Rogers

Sinclair ZX Spectrum

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graphics...**

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Now there's the ZX Spectrum! With up to 48K of RAM. A full-size moving-key keyboard. Vivid colour and sound. High-resolution graphics. And a low price that's unrivalled.

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The ZX Spectrum incorporates all the proven features of the ZX81. But its new 16K BASIC ROM dramatically increases your computing power.

You have access to a range of 8 colours for foreground, background and border, together with a sound generator and high-resolution graphics.

You have the facility to support separate data files.

You have a choice of storage capacities (governed by the amount of RAM). 16K of RAM (which you can upgrade later to 48K of RAM) or a massive 48K of RAM.

Yet the price of the Spectrum 16K is an amazing £125! Even the popular 48K version costs only £175!

You may decide to begin with the 16K version. If so, you can still return it later for an upgrade. The cost? Around £60.



Ready to use today, easy to expand tomorrow

Your ZX Spectrum comes with a mains adaptor and all the necessary leads to connect to most cassette recorders and TVs (colour or black and white).

Employing Sinclair BASIC (now used in over 500,000 computers worldwide) the ZX Spectrum comes complete with two manuals which together represent a detailed course in BASIC programming. Whether you're a beginner or a competent programmer, you'll find them both of immense help. Depending on your computer experience, you'll quickly be moving into the colourful world of ZX Spectrum professional-level computing.

There's no need to stop there. The ZX Printer—available now—is fully compatible with the ZX Spectrum. And later this year there will be Microdrives for massive amounts of extra on-line storage, plus an RS232 / network interface board.



Key features of the Sinclair ZX Spectrum

- Full colour—8 colours each for foreground, background and border, plus flashing and brightness-intensity control.
- Sound—BEEP command with variable pitch and duration.
- Massive RAM—16K or 48K.
- Full-size moving-key keyboard—all keys at normal typewriter pitch, with repeat facility on each key.
- High-resolution—256 dots horizontally x 192 vertically, each individually addressable for true high-resolution graphics.
- ASCII character set—with upper- and lower-case characters.
- Teletext-compatible—user software can generate 40 characters per line or other settings.
- High speed LOAD & SAVE—16K in 100 seconds via cassette, with VERIFY & MERGE for programs and separate data files.
- Sinclair 16K extended BASIC—incorporating unique 'one-touch' keyword entry, syntax check, and report codes.

KRAZY KONG

BY TIMOTHY BOONE

RUNS ON A PET IN 8K

Kong. Now there's a name to conjour with. And that's just what we've done. At least one of our readers has, and has come up with a version of the famous arcade game. Tim says his game is a very close copy of the arcade game's fourth screen — the most difficult and popular.

If you have not played the arcade version before then you'll need an introduction to our gorilla friend. The basic idea is that Kong has captured the beautiful heroine and taken her to the top of the Empire State Building.

Then Jump-Man — so called because of his amazing jumping prowess — comes to the rescue. Jump-Man has to rush to the top of the building and save the girl from the gruesome gorilla.

This game takes part in the attic section of the building. Jump-Man has to knock out the roof supports and send Kong crashing to his doom. There are eight supports and Jump-Man can knock them out by walking — or jumping — over them.

But there is a catch. These supports are each guarded by four moving fireballs — which also burn away the top and bottom rungs of Jump-Man's ladders. If you knock out all the plugs you'll get a bonus.

You start out with three lives and can lose these in many ways — as you'll find out. If you manage to conquer Kong the program loops and you get another chance to challenge him.

Tim says his game is a very close copy of the arcade game's fourth screen — the better?

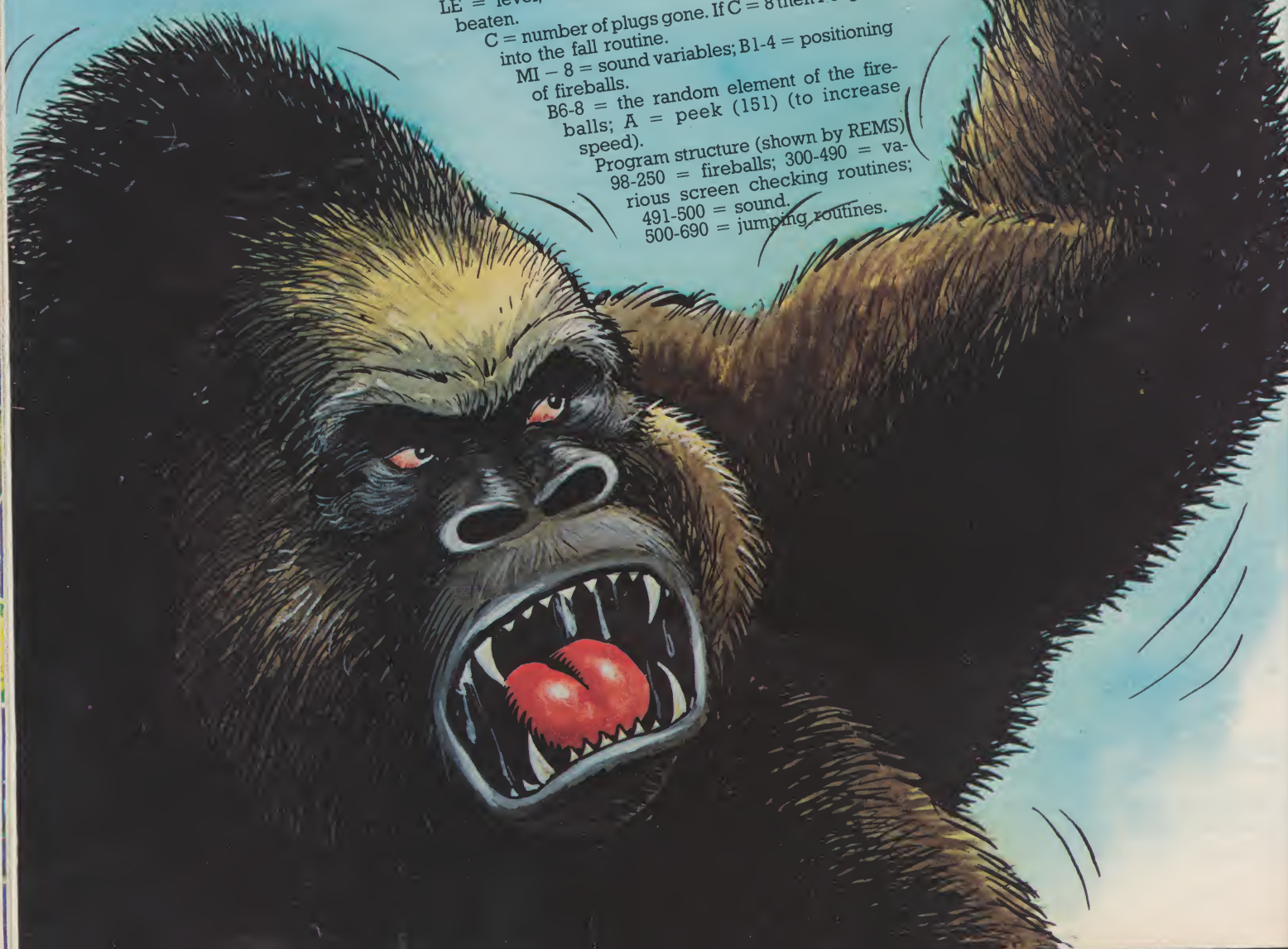
J = position of Jump-Man; SC = Score including the bonuses (D).
LE = level, increased by one every time Kong is beaten.

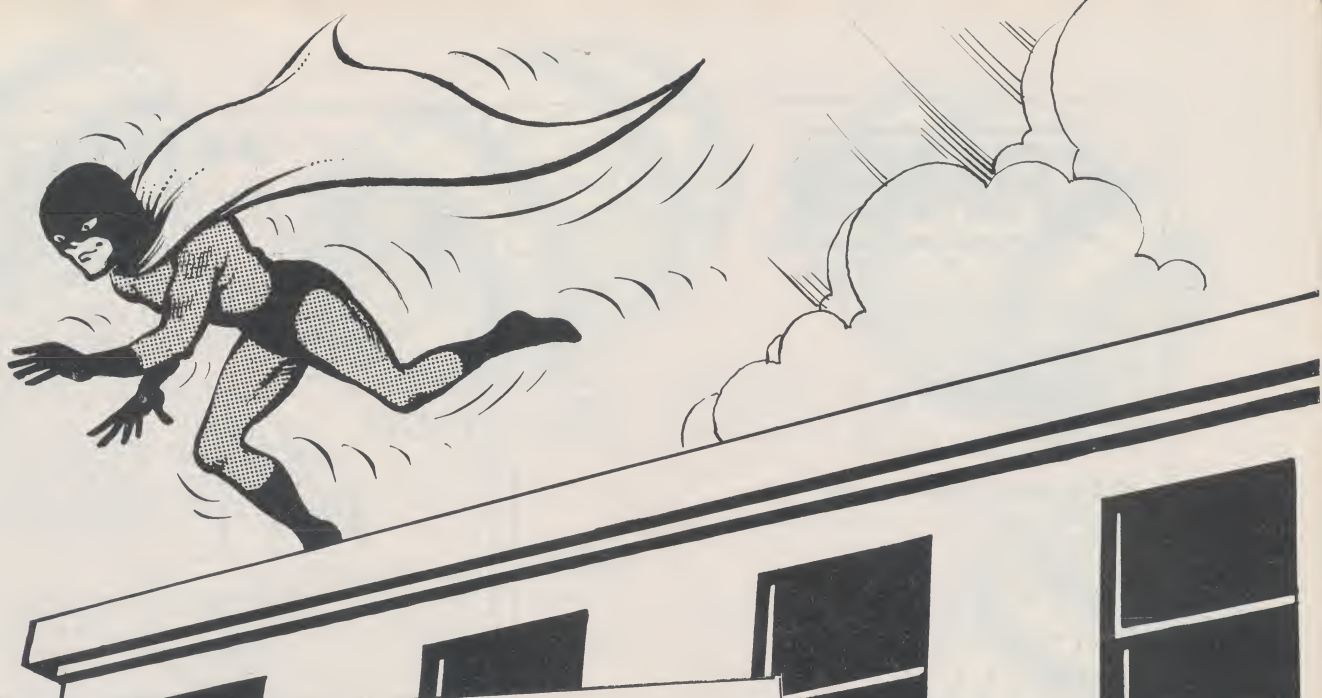
C = number of plugs gone. If C = 8 then Pet goes into the fall routine.

MI - 8 = sound variables; B1-4 = positioning of fireballs.

B6-8 = the random element of the fireballs; A = peek (151) (to increase speed).

Program structure (shown by REMS)
98-250 = fireballs; 300-490 = various screen checking routines;
491-500 = sound.
500-690 = jumping routines.





```

10 JM=3:SC=0:LE=1
20 K=41:P=40:H=39:U=102:O=151:S=42:L=32
30 M7=59467:M8=59466:M=83:B=81
35 M1=59467:M2=59466:M3=59464:N=250
50 GOSUB4000
60 B1=32897:B2=33119:B3=33297:B4=33510
61 U=102:C=0
70 I=5000:J=33667
80 GOSUB2000
90 GOTO800
98 REM**FIREBALLS!**
100 B5=INT(RND(0)*3):B6=INT(RND(0)*3)
110 B7=INT(RND(0)*3):B8=INT(RND(0)*3)
120 IFB5>1THENB5=-1
130 IFB6>1THENB6=-1
140 IFB7>1THENB7=-1
150 IFB8>1THENB8=-1
160 B1=B1+B5:B2=B2+B6:B3=B3+B7:B4=B4+B8
170 POKEB1-B5,L:POKEB1+B5,S:B1=B1+B5
180 IFPEEK(B1+P)=LTHENPOKEB1,L:B1=B1-B5*2:POKEB1,S
190 POKEB2-B6,L:POKEB2+B6,S:B2=B2+B6
200 IFPEEK(B2+P)=LTHENPOKEB2,L:B2=B2-B6*2:POKEB2,S
210 POKEB3-B7,L:POKEB3+B7,S:B3=B3+B7
220 IFPEEK(B3+P)=LTHENPOKEB3,L:B3=B3-B7*2:POKEB3,S
230 POKEB4-B8,L:POKEB4+B8,S:B4=B4+B8
240 IFPEEK(B4+P)=LTHENPOKEB4,L:B4=B4-B8*2:POKEB4,S
250 RETURN
300 REM**WALKING PLUG CHECKS**
310 IFPEEK(J+K)=UTHENPOKEJ+K,L:GOSUB396:C=C+1:SC=SC+100
320 GOSUB380
330 RETURN
340 RETURN
350 IFPEEK(J+H)=UTHENPOKEJ+H,L:GOSUB396:C=C+1:SC=SC+100
360 GOSUB380
370 RETURN
380 IFC>7THEN1500
390 RETURN
392 REM**CLIMB SOUND**
394 POKEM7,16:POKEM8,37:POKEM7,0:RETURN
396 POKEM7,16:POKEM8,15:POKEM7,0:RETURN
400 REM**>LADDER CHECKS**
410 IFPEEK(J-K)=8THENPOKEJ-1,8
420 IFPEEK(J-B)=8THENPOKEJ-K,8:RETURN
430 RETURN
440 REM**<LADDER CHECKS**
450 IFPEEK(J+B)=8THENPOKEJ+K,8
460 RETURN
470 IFPEEK(J-H)=8THENPOKEJ+1,8
480 IFPEEK(J-79)=8THENPOKEJ-H,8
490 RETURN
491 REM**JUMP SOUND**
492 POKEM1,16:POKEM2,37
493 FORR1=1TO3
494 FORT=1TO200STEP15
495 POKEM3,N-T
496 NEXTT
497 NEXTR1
498 POKEM1,0
499 RETURN
500 REM**>JUMP**
510 J=J-H:POKEJ+H,L:POKEJ,M:J=J+1:POKEJ-1,L:GOSUB410:POKEJ,M

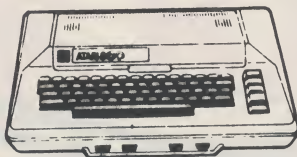
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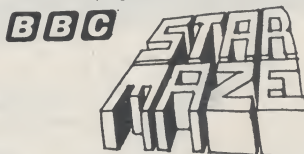
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ANDES ATTACK (8K)

Your spacecraft must attack the descending aliens and frustrate their evil intent. Fly your Ramjet fighter over the Andes mountain range and protect your llamas from kidnap by hostile UFOs. Features 5 kinds of UFO, controls include up, down, reverse, fire, thrust and smart bomb. Entirely in machine code. Requires 8K expansion and joystick. £8.00 + 50p P&P.

TRAXX M/C (8K + EXPANSION)

This is VIC 20 cross breed between the now famed 'Pacman' and the game 'Quix'. All in machine code, fast and fun with joystick controls, uses Hi-Res colour graphics. 8K or larger expansion needed. Only £6.00 + 50p P&P complete with instructions.

BLITZKRIEG

As seen at the Commodore show and reviewed by the Daily Telegraph. Fly your Vulcan Bomber over the enemy city and destroy the buildings. 25 levels of play, uses Hi-Res colour graphics and plays Rule Britannia between waves. Only £4.95 complete with instructions.

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Rox is a challenging game involving the defence of your lunar base from a deadly meteor shower. Rox-64 includes amazing sprite graphics displays and spacy sound effects, and an awesome 'mothership' display if you win the game. Top 10 scores are tabled along with their names. This program shows just what can be achieved using only Commodore-64 basic. Study the listing and learn how to use sprites and sound on this outstanding machine. £4.95 + 50p P&P.

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ZX81

CENTIPEDE (16K)

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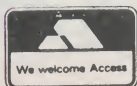
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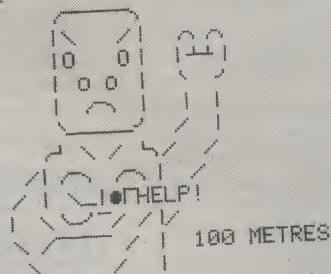
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```

1440 GETT$
1450 IFT$="Y" THEN RUN
1460 IFT$="N" THEN PRINT "N":END
1461 GOTO 1440
1470 SC=SC+1:GOTO 60
1500 REM**AFTERS FALL!**
1510 PRINT "N":FORB=1 TO 23
1520 PRINT "*****"
1530 PRINT "*****"
1540 FORG=1 TO 4
1550 PRINT "*****"
1560 NEXT G
1570 PRINT "          -KONG(RIP)"
1580 REM**CRASH SOUND**
1590 POKEM 1,16:FORB=1 TO 255:POKEM 2,B:NEXT B:POKEM 3,0
1600 PRINT "*****YOU WIN!!"
1610 GOSUB 1700
1620 PRINT "*****YOU HAVE"
1622 GOSUB 1700
1623 R$="*****"
1625 PRINT R$:"CONQUERED KONG."
1630 GOSUB 1700
1640 PRINT R$:"ISN'T TRUE LOVE"
1642 GOSUB 1700
1644 PRINT R$:"WONDERFUL?"
1646 GOSUB 1700:PRINT "*****NOW TRY AGAIN..."
1655 SC=SC+1:LE=LE+1
1660 FORW=1 TO 5000:NEXT
1670 GOTO 60
1700 FORW=1 TO 2000:NEXT
1710 RETURN
2000 REM**KONG PICTURE**
2020 PRINT "J"
2060 PRINT "*****SHOW HIGH CAN YOU TRY?"
2066 PRINT "*****"
2070 FOR Y=1 TO SR
2090 PRINT "
2100 PRINT "
2110 PRINT "
2120 PRINT "
2125 PRINT "
2130 PRINT "
2140 PRINT "
2150 PRINT "
2160 PRINT "
2170 PRINT "
2180 PRINT "
2190 PRINT "
2220 NEXT Y
2222 FOR P=1 TO 2000:NEXT P
2230 RETURN
4000 PRINT "*****KRAZY KONG"
4010 PRINT "    BY TIM BOONE, SOUTHAMPTON"
4020 PRINT "    THE BASIC IDEA: YOU ARE ON THE FOURTH"
4030 PRINT "    SCREEN OF THE ARCADE GAME. THAT IS, YOU"
4040 PRINT "    ARE IN THE ATTIC. KNOCK OUT THE PLUGS"
4050 PRINT "    BY WALKING OR JUMPING OVER THEM."
4060 PRINT "    WHEN YOU HAVE KNOCKED OUT ALL THE PLUGS"
4070 PRINT "    WATCH WHAT HAPPENS!"
4080 PRINT "    P.S. MAKE SURE THE FIREBALLS DON'T COME"
4090 PRINT "    TOO CLOSE!"
4100 PRINT "    PRESS <SPACE>"
4110 GETT$:IFT$="" THEN 4110
4120 PRINT "*****KEYBOARD COMMANDS:"
4130 PRINT "    8=UP"
4140 PRINT "    2=DOWN"
4150 PRINT "    4=LEFT"
4160 PRINT "    6=RIGHT"
4170 PRINT "    <=JUMP LEFT"
4180 PRINT "    >=JUMP RIGHT"
4190 PRINT "*****YOU SCORE 100 FOR EACH PLUG REMOVED"
4200 PRINT "*****AND WIN THE BONUS IF YOU CONQUER KONG."
4210 PRINT "*****PRESS <SPACE> TO PLAY..."
4220 GETT$:IFT$="" THEN 4220
4230 RETURN

```



ARITHMETIC AND THE EIGHT-BIT . . .

Eight-bit microprocessors have a very limited range of arithmetic instructions, providing only addition and subtraction — and, in the 6809, an eight-bit by eight-bit multiplication.

Unless you are writing mathematical programs you will rarely need more than simple addition and subtraction.

Before we look at the assembly language instructions for addition and subtraction we need to look at the way arithmetic is performed on binary numbers.

An addition with decimal numbers, say $26 + 47$, is carried out digit by digit: $6 + 7 = 13$, which is 3 and carry 1; 1 (the carry) $+ 2 + 4 = 7$, so the answer is 73.

We do binary addition in the same way, so the sum $26 + 47$ in binary is $00011010 + 00101111$, and we calculate the answer as follows:

Bit 0:	$0+1=1$
Bit 1:	$1+1=0$, carry 1
Bit 2:	$1(\text{carry}) + 0+1=0$, carry 1
Bit 3:	$1(\text{carry}) + 1+1=1$, carry 1
Bit 4:	$1(\text{carry}) + 1+0=0$, carry 1
Bit 5:	$1(\text{carry}) + 0+1=0$, carry 1
Bit 6:	$1(\text{carry}) + 0+0=1$
Bit 7:	$0+0=0$

The bits are numbered in the usual fashion, with bit 0 being the rightmost (least significant) bit and bit 7 being the leftmost bit).

Thus we find the answer is 01001001, which is, of course, equal to 73 decimal.

An eight-bit binary number can represent a decimal number from 0 to 255, but the sum of two numbers, each less than 255, may be more than 255.

If we take an example, say $190 + 77$, or $10111110 + 01001101$ in binary, and work through the addition we find that the eight-bit answer is 00001011.

However, in this case we have a carry of 1 from bit 7, and we really need nine-bits for the correct answer 100001011, equal to 267 decimal.

If this addition is performed on an eight-bit microprocessor only eight-bits can be retained in the answer but the ninth bit will be stored in the Carry Flag in the Flags register, so after the addition $00011010 + 00101111$ the carry flag would be 0, while after the addition $10111110 + 01001101$ the carry flag would be 1.

The carry flag can be used in further processing.

We can now look at the assembly language instructions for performing addition.



FLYING THE FLAG WITH THE 6502

The opcode mnemonic for the addition instruction on the 6502 is ADC (ADD with Carry), which adds an eight-bit operand, the contents of the accumulator, and the carry flag, leaving the eight-bit result in the accumulator and the carry in the carry flag.

The carry flag is always included in an addition, and we have two instructions to alter the carry flag; CLC (Clear Carry) makes the carry flag 0 and SEC (Set Carry) makes the carry flag 1.

To perform the eight-bit addition from the first example above we could write:

```
LDA #26; Get first number into accumulator
CLC; Make carry flag zero
ADC #47; Add second number to A, leaving result in A
```

We can use other addressing modes with the ADC instruction, including absolute addressing which we looked at last month, and other addressing modes we have not covered yet.

The registers in the 6502 hold eight-bits only and to add numbers larger than 255 (more than eight-bits), we have to break the addition down into eight-bit sections.

For an example of a 16-bit addition, using absolute addressing, suppose we have two 16 bit numbers, the first in memory locations 1000 & 1001 hex, the second in memory locations 1002 & 1003 hex, and we want the answer in memory locations 1004 & 1005 hex (the numbers would be stored with the low eight-bits

in the first of the two memory locations).

To get the 16-bit answer we first add the low eight-bits of the two numbers and then add the high eight-bits and the carry from the low eight-bits:

```
LDA $1000; Low byte of 1st number into accumulator
```

```
CLC; Make carry flag 0
```

```
ADC $1002; Add low byte of 2nd number
```

```
STA $1004; Store low byte of answer
```

```
LDA $1001; High byte of 2nd number into accumulator
```

```
ADC $1003; Add carry and high byte of 2nd number
```

```
STA $1005; Store high byte of answer.
```

HELPING THE 6809 ADD THINGS UP

For eight-bit addition we have the opcode mnemonics ADDA and ADCA which use accumulator A, and ADDB and ADCB which use accumulator B. ADDA and ADDB add the eight-bit number specified in the operand to the appropriate accumulator, leaving the answer in that accumulator.

ADCA and ADCB add the operand, accumulator and carry flag, leaving the result in the accumulator. All these instructions leave the carry from the addition in the carry flag.

To perform the addition in the first example above we can write:

```
LDA #26; Get first number into accumulator
```

```
ADDA #47; Add second number, leaving answer in A.
```

As in the 6502 we can use other addressing modes with these addition instructions.

We also have the opcode mnemonic **ADDD** for 16 bit addition; this operates on the accumulator D which you will remember from last month is really another name for the two eight-bit accumulators A and B together.

Thus, to add two 16-bit numbers, the first stored in memory locations 1000 and 1001 hex, the second stored in memory locations 1002 and 1003 hex, with the answer being stored in memory locations 1004 and 1005 hex (the numbers being stored with the high byte first), we would write:

```
LDD $1000; Get first number into D
ADDD $1002; Add 2nd number, leaving
answer in D
STD $1004; Store answer in memory.
```

There is no add with carry instruction for accumulator D.

Addition of numbers with more than 16-bits can be performed by breaking down the numbers into eight or 16-bit sections and adding a section at a time, using an **ADD** instruction for the low eight or 16-bits and an **ADC** instruction for subsequent eight-bit sections.

ADDRESSING YOUR Z80 CORRECTLY

For eight-bit additions we have the opcode mnemonics **ADD** and **ADC**, each of which can be used in three addressing modes.

The **ADD** instructions add the operand to the accumulator A, leaving the result in A, and the **ADC** instructions add the carry flag and the operand to the accumulator, leaving the result in the accumulator.

The instructions are **ADD A, data**; **ADC A, data**; **ADD A, reg**; **ADC A, reg**; **ADD A, (HL)**; **ADC A, (HL)**.

In the first pair the operand is included in the instruction; in the second pair the operand is the contents of one of the registers A,B,C,D,E,H,L; and in the third pair the operand is the contents of the memory location whose address is in the register pair HL.

The addition from our first example above can be performed in several ways:

```
LD A,26; Get first number into accu-
mulator
```

```
ADD A,47; Add second number,
leaving answer in A
```

```
or
LD A,26; Get first number into A
LD B,47; Get second number into B
ADD A,B; Add B to A leaving answer in
A etc.
```

We also have the 16-bit addition instructions **ADD HL,BC**; **ADC HL,BC**; **ADD HL,DE**; **ADC HL,DE**; **ADD HL,HL**; **ADC HL,HL**, which add, or add with carry, a register pair to the register pair HL, leaving the answer in HL.

To add two 16-bit numbers, the first stored in memory locations 1000 hex and 1001 hex, and the second stored in memory locations 1002 hex and 1003 hex, with the answer going into memory locations 1004 and 1005 hex (the numbers being stored with the low byte first), we can write:

```
LD HL,(1000H); First number into HL
LD BC,(1002H); Second number into BC
ADD HL,BC; Add BC to HL leaving
answer in HL
LD (1004H),HL; Store answer in mem-
ory.
```

To add numbers of more than 16 bits we must break up the addition into eight or 16-bit sections and perform the addition one section at a time, using an **ADD** instruction for the low eight or 16-bits and an **ADC** instruction for subsequent eight or 16-bit sections.

PAY YOUR MICRO A COMPLEMENT . . .

So far we have regarded all binary numbers as being positive, eight-bit numbers representing a decimal number from 0 to 255 and 16-bit numbers representing a decimal number from 0 to 65535.

There are several ways of representing negative numbers in binary, but the commonest, and the most useful with microprocessors is *twos complement notation*.

To get the twos complement of a binary number we change the 0s to 1s and the 1s to 0s and add 1 to the result.

For example, to find the twos complement of 10110111 we first change 0s to 1s and 1s to 0s, giving 01001000, then add 1, giving 01001001.

If we add an eight-bit number to its twos complement we always find that the answer is 00000000, with a carry of 1, so the twos complement can be regarded as the negative of the number. Thus we have:

```
-1=twos complement of 00000001=
11111111
```

```
-2=twos complement of 00000010=
11111110
```

The easiest way of performing a binary subtraction by hand is to add the twos complement, so, for example 1-2 becomes $1 + (-2)$, or $00000001 + 11111110$ which gives an eight-bit answer of 11111111. This is the number we get when we work out the twos complement form of -1.

In twos complement notation an eight-bit binary number represents a number between -128 decimal (10000000 binary) and +127 decimal (01111111 binary). Note that in the twos complement notation the high order bit of a negative number is 1 and the high order of a positive number is 0.

The subtraction instructions in the eight-bit microprocessors treat binary numbers as having the twos complement form, so, for example $10 - 5$ would give the binary result 00000101 and $5 - 10$ would give the binary result 11111011.

In the addition of binary numbers we that when the binary numbers were regarded as representing positive numbers in the range 0 to 255 the result of an addition could be more than 255, in which case the answer was a number less than 255 but the carry flag was set to 1 by the addition.

We have a similar situation with addition and subtraction of twos complement binary numbers.

If the result of the decimal calculation with numbers in the range -128 to +127 comes outside that range the eight-bit answer produced by the processor must of course be treated as a number between -128 and +127, but the **Overflow Flag** (called V in the 6502 and 6809, and O or P/O in the Z80) is set to 1.

The assembly language instructions for subtraction are similar to the addition instructions, with **SUB** instead of **ADD** and **SBC** instead of **ADC**, but there are differences between the three processors in the way the carry is handled in the **SBC** instructions.

The 6809 and Z80 have eight and 16-bit **SUB** and **SBC** instructions which can be used in exactly the same way as the **ADD** and **ADC** instructions. The 6502, however, has only **SBC** instructions, and we need to look at this separately.

The **SBC** instruction performs the calculation

Accumulator — operand — comple-
ment of carry

so if the carry is 0 we get accumulator — operand - 1, and if the carry is 1 we get accumulator — operand - 0.

Thus, to perform a straightforward eight-bit subtraction we must set the carry flag to 1 before performing the subtraction. To subtract 5 from 10 we need to write:

```
LDA 10; Get 1st number into accumula-
tor
```

```
SEC; Set carry to 1
SBC 5; Get answer in accumulator.
```

We can perform 16-bit (or more) subtraction in a similar way to addition. With subtraction instead of addition our previous example becomes:

```
LDA $1000; Low byte of 1st number into
accumulator
```

```
SEC; Make carry flag 1
```

```
SBC $1002; Subtract low byte of 2nd
number
```

```
STA $1004; Store low byte of answer
```

```
LDA $1001; High byte of 1st number into
accumulator
```

```
SBC $1003; Subtract high byte of 2nd
number and carry
```

```
STA $1005; Store high byte of answer.
```




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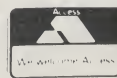
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BETWEEN THE LINES...

The effect of hidden line removal is shown in the two accompanying illustrations of rockets. One has hidden lines removed and one does not. I hope you will agree that the drawing of the rocket with the hidden lines removed (Fig 2) appears much more solid and realistic than the other.

The methods used for removing hidden lines are quite complex and highly mathematical, but for certain special cases they can be made comparatively simple.

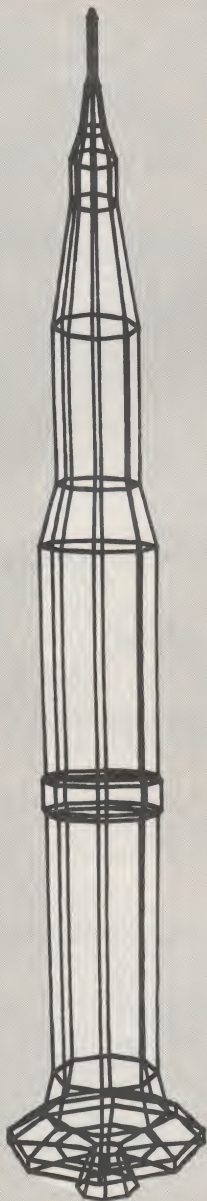


Fig 1.

A technique that helps in producing realistic images of solid objects is the removal of hidden lines from drawings of the object.

When describing a solid object, all the lines that are needed to represent its edges must be given because it may be necessary to view it from any angle.

A view of it from a specific viewpoint can be generated by using the perspective transformation. However, if the transformation is applied indiscriminately to all the lines of the object, what will be seen is a *wire-frame* representation of the object with the lines that ought to be obscured from view because they are at the back of the object displayed just as prominently as those at the front which actually are visible.

Although the *wire-frame* type of image does give a good idea of the shape of the object, it does not always convey the impression of solidity that one might want to achieve. Besides this, it sometimes gives images that are ambiguous in the sense that they make visual sense in more than one way.

These problems can all be overcome if the lines that would be hidden from the viewer are removed.

The first point to make is that what conceals the part of an object that is hidden from view is a surface in front of it. The surface itself is surrounded by edges, all of which will be lines.

So the way to find out which are hidden from view is to determine which surfaces are masked from the observer by others, and then not to draw the lines representing the edges of hidden surfaces.

For this reason, a solid object needs to be described not simply in terms of the lines that give its edges, but also in terms of its surface facets. The lines outlining each surface facet must however be given.

To give an example, when dealing with a cube all its six surfaces would need to be given (those at the front, back, left, right, top and bottom). Each would be described by the four lines that surround the square surface facets.

One fairly simple way to remove the hidden lines is to draw each surface as a filled-in area starting from the back (that is, with the



Fig 2.

surfaces furthest from the observer), and working forwards.

In this way plotting the nearer surfaces will automatically cause them to overlay the ones that are further away, thus removing the parts that ought to be obscured.

A second method starts by plotting the points on the object nearest to the observer. It proceeds by examining the points that are further away, but along each line of sight from the observer to the object a region of visibility is maintained by continually updating the upper and lower horizons between which visibility is blocked by the parts already drawn.

Naturally the points that are found to be masked from view are not drawn, thereby removing the hidden parts. Only lines outside the marked region are drawn.

The only place that I have seen a comparatively simple program based on the last method and written in Basic is in *Practical programs for the BBC Computer and Acorn Atom* by David Johnson-Davies (Sigma Technical Press, 1982).

This gives a program for drawing surfaces with hidden line removal. For purposes of comparison, a program for drawing the surface without removing the hidden parts is also given there.

Adventure

HOW TO FIND YOUR WAY...

The deeper you get into writing your Adventure game the more difficult it will become to find your way around the program lines as it continues to expand.

This will be especially true if you have no printer and must catch the lines as they scroll up the screen. Another difficulty is that you may eventually need to renumber the lines to squeeze in a previously unforeseen bit of logic. Then even the line numbers that you remembered will be lost!

Of course, a line printer will make life easier, but is not essential. Having written three Adventures without one, I have developed some guidelines to make life easier.

The first rule is to number lines in increments of no less than 10. This will leave plenty of gaps for insertions, reducing the likelihood of having to renumber.

Line numbers must be planned in advance, and the whole program sprinkled liberally with remarks. Back in the May issue I summarised how blocks of code might be laid out, and figure 1 shows a suggested range of line numbers for each block.

You can see that the bulk of the program is contained in Block 5 where the routines for each verb reside. Let us look in more detail at this block, as it contains the least distinguishable code in the program.

Start the routine for each verb on an increment of 1000, and then in 10's for each verb. Since each verb

BLOCK	LINE RANGE	PURPOSE
1	100-150	CLEAR string space DEFINE variable types DIMENSION arrays
2	200-250	READ DATA Assign variables
3	300-450	Check special conditions Clear screen PRINT display Await INPUT
4	500-600	Interpret INPUT
5	1000-30000	Execute plot (Verb routines)
6	40000 +	Set standard replies
7	50000 +	DATA statements

Figure 1. Line number range of each coding block

routine will be accessed by an ON K1 GOTO statement (K1 being the decode number for the verb) it is useful to precede each of these with a REM.

But wait! One of your last tasks on completion of the program will be to remove the REMs for three reasons; to save memory, speed execution, and to remove clues for would-be cheats! If the REMs are written on the lines pointed to by the ON K1 GOTO line numbers, undefined line errors will be the order of the day when they're deleted.

So place them on the line immediately preceding the start of each routine. Thus REMs for Block 5 would appear on lines 999, 1999, 2999 etc.

When they're gone, the running of the program will not be affected. As a bonus, deleting them will be easier, since they will be recognised as having numbers ending with a 9.

Figure 2 shows some typical code using REMs. Note that they are surrounded by asterisks — much easier to spot when scrolling!

```

599 REM ***** GOTO DECODED VERB ROUTINES *****
600 ON K1 GOTO 1000, 2000, 3000 ... ETC

999 REM ***** TAKE *****
1000 IF IN > 6 THEN Q1$= "I'M CARRYING TOO MUCH" : GOTO 100
1010 IF P(K2) = 50 THEN Q1$ = "ALREADY GOT IT!" : GOTO 100
1020 IF P(K2) <> LN THEN Q1$ = "DON'T SEE IT HERE" : GOTO 100
1030 IF C(K2) <2 THEN Q1$= "I CAN'T —YET" : GOTO 100
1040 P(K2)=50 : IN = IN + 1 ; Q1$= "OK" ; GOTO 100
1999 REM ***** DROP *****
2000 IF P(K2) <> 50 THEN Q1$="NOT CARRYING IT" ; GOTO 100
    etc, etc. ...
  
```

Figure 2. Typical code showing numbering of REMs

As a change from software, I bring you the lowdown on a book — *The Captain 80 Book of Basic Adventures*. This American publication is by Robert Liddel, and set me back just under £12.

The opening chapters explain to the newcomer what Adventure is and how to play it. Further chapters advise would-be programmers how to write Adventure (plotting rather than programming the game), and how to market it when written. There is also an "Adventure generator" which I hope to come back to at a later date.

However, the bulk of the book contains the listing of no fewer than 18 Basic Adventures, including the works of well-known authors like Scott Adams, Greg Hassett and Lance Micklus.

At this point I must make it quite clear that the listings are all in Level II Basic, a fairly standard Microsoft Basic used by TRS-80 Models I and III, and the Video Genie. A foreward to the book written by Scott Adams explains most of its peculiarities.

Each listing is preceded by some notes on the program, and all but one look readily convertible to other Basics, being free from PEEKs and POKES. Anyone with 16k of memory, a good knowledge of their own machine's Basic, and an awareness that the TRS-80 screen has 64 × 16 characters should be able to use most of these listings. All are printed in exceptionally clear plain type rather than a photocopy of printer output, and although this made me apprehensive, I keyed in *Revenge of Balrog* by Don and Freda Boner and the only errors I came across were self-inflicted!

I can recommend it to serious Adventurers — but if you don't have a TRS-80 compatible machine, do browse it before purchasing.

It is published by 80 Northwest Publishing Inc., USA. I bought my copy from Gamer of Brighton, but imagine that other dealers could obtain a copy.

BY KEITH CAMPBELL

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PLANET PATROL

Spectravision's Planet Patrol is an all action scrolling space game for the Atari VCS.

Imaginative graphics and considerable playability are sure to make this game tough competition for Atari's own Defender.

The idea of the game is to rescue a pilot whose ship is drifting helplessly in space.

But at the same time your planet is being attacked by the TIAs (troublesome invading aliens) which you have to shoot down to score points.

When you have shot down the first wave of enemy ships and dodged their missiles you will be able to attack the enemy bases. But be careful to dodge the debris from the exploding missile bases as you will need to get past this to land at the space station in order to refuel for the night patrol. As you fly on the sky gets gradually darker and finally black.

The game now gets really tough as the screen is only lit by the moon and the occasional explosion of alien craft as your lasers blast deep into the night.

Also new from the SpectraVision stable this month is a pretty and compulsive grub gobbling game called Tapeworm.

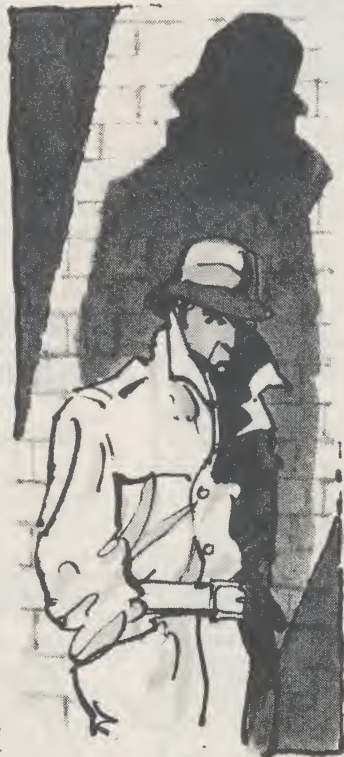
You guide an ever lengthening snake around the screen eating up the pieces of food that flash up as you go.

It gets ever more difficult to control the snake and you can eat your own tail if you are not careful. Just to make things a little more difficult there are also two villains to be dealt with.

Nexar is a deep space 3D shoot out. Though not quite in the Activision Starmaster class it is none the less impressive.

Made in Hong Kong and imported from America there are six games in all in the brand new SpectraVision range.

The other titles are Gangster Alley — a sort of shooting arcade where the heads of various villains pop up for you to shoot at, Cross Force — another space



game, and China Syndrome a tough race against time to stop a nuclear reactor exploding, based on the recent movie of the same name.

The games are available in this country in compatible PAL form from Pancom of Grimsby at £24.95.

LET'S CLUB TOGETHER

GAMES CLUB

If you are fed up of forking out high prices for the latest video game cartridge then this is your chance to win the entire range of Atari compatible games.

The offer comes from the Video Games Club — a new mail order firm which offers a money-back guarantee to club members if they find they can purchase cartridges cheaper elsewhere.

To enter the competition you have to join the club. This costs £25 for life or £7.50 for one years trial membership.

New members will also receive two free puzzles worth over £8.

The first 1,000 members will then have their membership numbers fed into a computer and the lucky winner will be randomly selected.

WELCOME TO THE THIRD GENERATION COLECOVISION

If you got an Atari VCS or Mattel Intellivision games machine for Christmas you may well be kicking yourself, or your dad, when you hear about the exciting new ColecoVision video games system.

The ColecoVision is one of the "Third Generation" of video games machines.

The video games boom was sparked off by the early bat and ball type games which were often given away free with new TV sets.

The next big breakthrough came with programmable video games such as the Atari VCS on which you could play an infinite number of games by simply purchasing a plug-in cartridge of your choice.

The so-called "Third Generation" machines — of which the ColecoVision is the first, are an upgrading and refinement of the second generation machines.

The ColecoVision has a massive 32K of Rom and 17K of Ram nestling under its black exterior. This makes it several times more powerful than all the video games machines currently on sale and also more powerful than most of the popular microcomputers as well.

Converted to gamers language this means superb detail, more moving characters than were previously possible, and greatly enhanced sound and colour.

The new machine will go on sale in the UK in the late Spring and early Summer with an impressive range of well known arcade titles. Prominent among these are Zaxxon, Donkey Kong, Gorf and Turbo.

Donkey Kong is practically identical to the Nintendo original and only the three hours play for twenty-pence merchants will be able to notice any difference...

Zaxxon is 90% as good as the arcade game which, for a "state of the art" 3D game is pretty good. Gorf too is very close to its arcade counterpart.

The fourth big game from the

arcades to go with the new machine is the driving game Turbo. This requires a plug-in dashboard with steering wheel and a foot pedal accelerator which connects to it. The gears are changed with one of the hand controllers which also attaches to the dash.

Taking big names straight from the arcades will be deliberate policy to support the ColecoVision when the machine goes on sale. Through its parent company CBS and Ideal Toys, ColecoVision has first option on buying arcade games from some of the big American and Japanese arcade game designers.

Perhaps the most important of these add-ons is a converter which enables all existing games for the Atari VCS to be played on the new system.

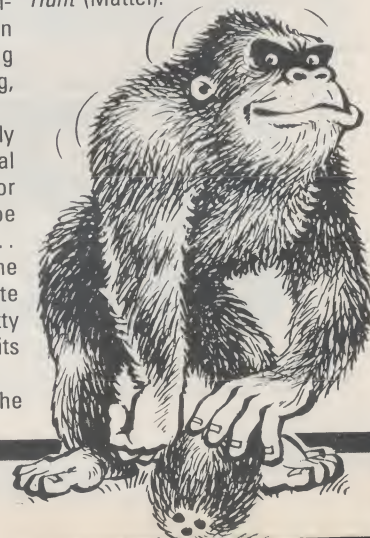
The next important add on will be a computer keyboard which will turn the ColecoVision into a home computer — a pretty powerful one too as it will access 32K of Ram for user programs.

TOP SELLERS

Mattel Intellivision and Atari VCS games again dominate our top 10 video games best sellers for the month of November.

Intellivision titles come in first, third, seventh, ninth and 10th places. Dungeons and Dragons holds onto its first place spot as pre-Christmas best seller.

1 *Dungeons and Dragons* (Mattel); 2 *Defender* (Atari); 3 *B17 Bomber* (Mattel); 4 *Pacman* (Atari); 5 *Empire Strikes Back* (Parker Brothers); 6 *Star Raiders* (Atari); 7 *Lock 'n' Chase* (Mattel); 8 *Frogger* (Parker Brothers); 9 *Night Stalker* (Mattel); 10 *Sub Hunt* (Mattel).



SUPERHERO MEETS THE SUPERBADDIE!

SPIDERMAN

Parker Video games will soon be providing some excitement at your local video games shop with personal appearances from Spiderman and Star Wars villain Darth Vader to promote their new games for the Atari VCS.

They will also be launching the Parker Video Games Club with offers of high score T-shirts, posters and cartridge holders, plus the latest information on new releases and when and where the super-heroes will be appearing in person.

There will be plenty to think about on the new games front too with Amidar and Spiderman rocketing towards the C&VG top-ten Atari VCS chart.

Spiderman is challenged to a life or death race. He has to climb a sky-scraper and stop the Green Goblin exploding his super-bomb and devastating the city.

Spiderman climbs the building by shooting out his web and then winching himself up. You control the action using the joystick.

Pull the joystick down and Spiderman's web stretches enabling him to swing and kick down Green Goblin's henchmen who appear at the windows. You must be careful not to let the web swing across one of the Goblin's men. They will cut it — sending our hero crashing down to the ground.

The key to success in Spiderman is to use the web accurately and sparingly. You only have a certain amount of web strength which is displayed on the screen and which can also be supplemented by defusing the Goblin's bombs.

Also new from Parker Brothers this month is a version of the arcade game Amidar. This is a crazy-race to paint in the screen with blue boxes.

You are randomly an ape and a paint roller and are pursued by pigs and tribesmen. Quick reactions and a systematic approach are the keys to success in Amidar.



Parker Brothers have fifteen new Atari games planned for 1983, with Intellivision and Philips versions promised for next July.

Next out will be a second Star Wars title called Jedi Arena and another game straight from the arcades. Super Cobra, the all action helicopter shoot-out, needs no introduction to Arcadesters.

Parker Video games are available from most good Atari stockists at £29.95.

ANYONE LOST AN ARK?

RAIDERS

Ever wished you were Indiana Jones, the swashbuckling hero of Raiders of the Lost Ark? Then this is your chance to share some of the action as you join the search for the fabled Lost Ark of the Covenant.

In this new game for the Atari VCS you must find the Ark which is hidden in the Valley of Poison, located somewhere outside the Egyptian city of Cairo.

The game follows the adventure format. You move Indy around the screen searching for clues, collecting treasure, and articles such as a whip, a pistol, and flute, which you will need to overcome specific challenges during the game.

The first scene puts you down in a market place where you have to collect the equipment

you will need for your journey.

The first thing to buy is a flute which protects you from the snakes, spiders, and tsetse-flies that pursue you later in the game.

You will also need a grenade to break your way into one of the rooms where more clues are hidden.

The whip and the pistol enable you to kill some of the adversaries you encounter and also let you blast the walls of the dungeons should you unfortunately find your self incarcerated during the game.

You are only allowed six pieces of equipment at a time. These are all shown at the bottom of the screen and you select the one you want to use by moving the indicator dot to below the appropriate piece.

As with most adventure games you have to explore a number of rooms containing various challenges. In Raiders they are based on the film.

Once you have found your way into the enormous mesa-field you can begin the search for the Valley of Poison wherein you will find the ark.

The game is played with both joysticks. The right joystick moves Indy around the screen, cracks his whip, fires his pistol, and explodes his grenade.

The left joystick moves the indicator dot enabling you to select items of equipment.

The game will be in the shops this month retailing at £29.95.

MORE DREAMS FROM THE AMERICANS

INTELLIVISION

Intellivision owners, jealous of the wider choice of games available for the Atari VCS, will have plenty to smile about in 1983.

The big three independent American games makers have now launched cartridges for the Mattel machine.

Prize-winning Demon Attack which was the top selling video-game in America in 1982 is now available for the Intellivision.

Also new from Imagic is an undersea battle game called Atlantis, a Donkey Kong-type game called Beauty and the Beast and a game of truly breathtaking graphics entitled Micro-Surgeon.

This last is based on the science-fantasy film Fantastic Voyage in which a submarine was reduced millions of times in size and injected into the body of a top scientist.

In Micro-Surgeon you are that submarine, seeking out and repairing diseased organs.

The talented Activision team have also turned their skills into original games for the Mattel machine. Pitfall — the jungle adventure in which our hero swings across crocodile infested swamps, seeks treasure, and is chased by scorpions and other nasties can now be enjoyed on your Intellivision.

The second Activision game is Stampede. This transforms you into a cowboy on horseback, armed with a lasso with which you must round up the stray cattle.

Coleco have also joined the rush to produce software for Intellivision with versions of their four hottest titles — Donkey Kong, Gorf, Zaxxon and Turbo.

Add to the above all Mattel's own releases and the recent announcement from Parker Brothers that their titles will be available in Mattel format by next July.

It all adds up to much more choice for Intellivision owners in the New Year.

THE SEVENTH

HELPING US TO HELP YOU

The Seventh Empire is a unique game and it is bound to cause some unique problems. We feel that we have done everything we can at our end to combat these problems but we will need a lot of help from the players.

Time is going to be critical as we must process the orders in time to work out the galactic map for the following issue.

To help with this we will need to be able to easily identify Seventh Empire orders in our post and single them out for processing. Please write "Seventh Empire Orders" on the envelope.

We will need to be able to read your orders clearly, so work them out in rough before filling in the coupon in C&VG, that way your order sheet will not be plagued by crossings out. And try to write clearly and neatly in block capitals, so that we cannot misunderstand your orders.

Always fill in your own code number as this is a double check

A Colour Genie home computer is the prize awaiting our top-scoring Seventh Empire commander.

If you can guide your space tribe to the top profits for this opening game turn of Seventh Empire, you will have earned your reward.

And any supreme space commander would be pleased to map out future galactic campaigns on such a fine piece of modern technology.

Lowe Electronics is hoping the Colour Genie will take over from its popular predecessor.

on order authenticity. You will find your seven fleets starting positions and your code number on the printout sheet with your rule book. If it is missing, or if the sheet contains the wrong name and address, please ring and let us know.

Remember which of your fleets is where. Fleet 1 will be fleet 1 throughout the game and if you have jumbled your fleets the computer will not accept the moves as legal.

The order form will appear each month (see opposite) with a clear scissors mark and cut-line around it.

A LITTLE GENIUS

It offers 16K Ram and 16K of Basic Rom and a full-size type-writer keyboard. Eight vivid colours, high resolution graphics, three channel sound and a 40 x 24 character screen format. It also boasts four programmable function keys and a port for plug-in program cartridges and would cost you £224.50 in the shops.

So whether you want to keep your hand-in playing space invaders between stellar planning

for your successful fleets, or would prefer to produce your own program on the likely number of star cruisers to visit Vepos in March, the Colour Genie will provide for hours of entertainment.

So all you need to do is work a little magic on your order sheet perhaps rub the odd lantern and, who knows, a Genie may soon materialise on your doorstep ready to do your bidding.

Please cut it out as close to the line as possible and try to avoid excessive folding.

The forms are coded by number and colour and we can only accept orders written out on forms cut from the magazine, not photocopies or in any other piece of paper.

At our end the game has been designed to eliminate operator error and we are confident that this has been achieved as closely as possible but certain queries and problems may crop up during play. To sort these out we are having a Seventh Empire problem hour every week.

If you have any problems or queries on the game please ring 01-278 6558 between 3pm and 5pm on Fridays. Then we will have the computer up and running and will be able to answer your queries.

Post is both the asset and the bane of play-by-mail games. An asset because it enables games enthusiasts to find other enthusiasts and play against one

another. A bane because post is not 100% reliable.

A player can miss out a turn and start again next month without being affected. However, late orders are a cause of misery, especially when you check through the following month's issue and find your moves would have earned top profits. (A bit like winning the Pools after having forgot to post the coupon.)

A deadline date when your orders are needed back, is printed opposite and it is vital that you should post them back in plenty of time to make up for the vagaries of the post.

There's also the danger that you may get your orders in narrowly too late and so believe your fleets to be elsewhere, while they'll actually be lost in space.

Once the computer starts processing it takes many hours for it to come up with the new map and we cannot include late entries. So that deadline date will be final.

YOU CAN STILL ENTER

If you haven't yet entered The Seventh Empire and are tempted by what you see here. Then it's not too late to put your name down to control a space tribe in this massive stellar conflict.

You won't be able to join in this month's competition but we will include your fleets in the following month's game.

Fill in the entry form below and return it to us quickly. The deadline for players wishing to start their Seventh Empire sojourn in March's issue, is the 24th of January.

To enter The Seventh Empire only costs the price of a stamp each month and enters you into an easy-to-play tactical struggle with up to 10,000 other Computer & Video Games readers.

We will despatch a 16 page rulebook to you and include you in the next available game turn.

Please include me in the Seventh Empire Competition in March.
I name my tribe:

My name is:

Address

Telephone

SEVENTH EMPIRE MOVEMENT ORDERS

Key	ORDER	MOVEMENT MODE	CONDITIONS
S M T	STAY MOVE TRADE	NONE TRAVEL TRAVEL	None Between empires at peace Between stars of different types and empires at peace
R R A	RAID RETURN ATTACK	ATTACK ATTACK ATTACK	Star of alien empire (phase 1) To star of original empire (phase 2) Star of empire at war with original empire
J C P	JUMP CARGO PLUNDER	GATEWAY GATEWAY GATEWAY	To another gateway star To another gateway star To another gateway star

The key refers to the computer code for the order but you should write it out in full.

NTH EMPIRE

A GALAXY TO CONQUER

Your seven fleets should now be ready to be despatched into the galactic fray. But first the following information will help you plan your campaign through the galaxy, represented by the Galactic Map (right).

The Raid Penalty to be put into your equations for this first turn is "3".

The deadline for orders is **Monday, January 24th**, so don't wait too long before returning them.

Learn to read the Diplomatic Diagram below: a line between two empires means they are at war with one-another. So the Sun Empire can expect attacks from the Bloodline, Amethyst and Pirate Empires this turn. While the Water Empire is only at war with the Dead Empire.

The seven Imperial Ships are not currently shown on this map as no player has had a chance to lay claim to one yet.

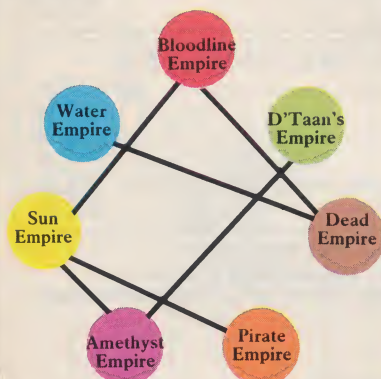
Remember: orders can only be entered on the form below (not photo copies).

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151 0	139 0	172 0	199 0	143 0	159 0	132 0	183 0	155 0	182 0
VIZAX ○	QIRUS ♥	HAZAN ◆	ABOB ○	SONER *	VEPOZ ♥	QATOT ○	HEZOD *	ASOL *	SUXEK ♥
156 0	153 0	141 0	209 0	184 0	159 0	162 0	187 0	183 0	196 0
BAROV *	WIDAN *	RURUS ○	MUPIP *	NAXIG ○	BETID ◆	WAVAB ○	RIVEV *	MEGUD ○	NABOK ○
147 0	165 0	138 0	153 0	139 0	144 0	129 0	156 0	183 0	158 0
DALIX ♥	OLEX ♥	TASAT ♥	CAZUV *	GOVAX ♥	DITUG ◆	OKAP ♥	TOXAZ ◆	CIXAN ◆	GOTEG ♥
162 0	151 0	157 0	148 0	162 0	180 0	172 0	139 0	150 0	124 0
ERAK *	KOVEP ◆	USUG *	PEBOB ♥	JADEG ◆	ENAK ○	KEPAR ♥	UGON ◆	POROV ◆	JINIS *
159 0	171 0	211 0	168 0	181 0	145 0	120 0	187 0	125 0	137 0
FADIS *	LOKIK ♥	YUSES *	XAPUS ○	IXIP *	FAGIL ♥	LIZAG *	YODAZ ◆	XUGOD *	IBED ♥
143 0	177 0	148 0	127 0	194 0	191 0	133 0	162 0	160 0	185 0
VASUX *	QUXIN ○	HIPEB ◆	ASOR ○	SIDAL ♥	VIZET ◆	QAVUV *	HAKUB ○	APEL ◆	SABAG ♥
160 0	150 0	171 0	172 0	179 0	161 0	177 0	167 0	159 0	160 0
BUREP ♥	WAGAP ♥	ROLEK ♥	MINEP ○	NUVEX ♥	BAZIX ○	WUWIV ♥	RORUL ♥	MEDEN ◆	NUZET *
158 0	148 0	159 0	132 0	132 0	141 0	138 0	172 0	152 0	160 0
DUSUP *	OPOD *	TUBOX *	CIGER ○	GAZOR *	DABAG ♥	OTAN ◆	TUXUX ○	CESER ♥	GIRIX ◆
146 0	172 0	161 0	185 0	153 0	164 0	181 0	141 0	141 0	146 0
ELAR ○	KERUP ◆	ULEB ♥	PIRAD ♥	JAXEL ○	EDIB ◆	KOLOL *	UKOP ○	PULUD *	JUVAK ◆
188 0	168 0	168 0	164 0	197 0	161 0	168 0	176 0	142 0	155 0

The Galactic Map

Star type	Trade value
♥ Elixir	200
◆ Gem	150
○ Energy	100
* Gateway	50

Star Types



The Diplomatic Diagram

Orders in Block Caps please

Name:

Code No: Telephone No:

	AT	1st Movement phase		2nd Movement phase	
		ACTION	STAR	ACTION	STAR
FLEET 1					
FLEET 2					
FLEET 3					
FLEET 4					
FLEET 5					
FLEET 6					
FLEET 7					

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REVERSI

OPENINGS: PAIR EXCELLENCE

Chess has a vast store of opening theory which takes white and black into even middle game positions, built on centuries of study and documentation.

Reversi is also building up a wealth of opening theory which consist of a known sequence of moves at the start of a game and continue until one side has a large choice of good replies to choose from.

These openings usually involve filling in some, or all, of the 16 squares which make up the centre of the Reversi board.

By knowing a bit about openings, you instantly increase your chance of winning, and ensure that no-one will brow-beat you into submission early on in the game.

Unlike chess openings, Othello is young enough for openings to change according to whims of great players. So in a computer program you cannot hope to keep abreast of top moves. Better to avoid the worst blunders, then add a strong "random" factor to the rest, so that at least sometimes it plays brilliantly!

Black's first move is forced due to symmetry, so we will choose e3 as in the first diagram. White then has three choices which we have named as follows:- the "Pall" family marked "P" at f5, the "Jerbal" at d3, and the Desert at f3. Top players avoid the Jerbal, though I favour it if White is willing to play outside the

The champions of the Reversi (or Othello) board study their adopted game just as thoroughly as the chess and bridge masters.

And this includes noting down classic games between rival champions and building up an opening theory.

Unlike chess where the book of openings is backed up by several centuries of chess publishing, Othello strategy is still a fairly young science and opening theories are not as stable as those in chess.

All of which makes teaching your computer to use the best openings in its first six to eight moves, very difficult.

centre. So tell the computer to play Desert or Pall most of the time.

Let's now see the general algorithms that help you avoid blunders.

The first rule is one of my basic "rules of thumb" of taking as few pieces as possible, but count the four pieces in the centre as "half" pieces. The second rule is to prefer to complete a "Pair". There are four "Pairs", each being the two adjacent squares to a centre corner, such as the centre sides at d6 and c5 marked "S".

If one square of a Pair is occupied, then the other square is attractive. It often cuts through enemy pieces, which is good play in the middle-game too.

The third rule is to mildly dislike a centre corner if its Pair is empty, to hate a centre corner if its Pair is half-occupied, and to love it if the

Pair is occupied. Balance this with previous rule of thumb of course!

Diagram 2 shows an elegant opening which illustrates the general algorithms well. White plays the Pall at f5, to which Black completes the Pair at e6. White avoids the half-empty Centre corner at f3, so has to play d3. Black completes the Pair at c4.

White could then play at the f6 corner, but Black would reply at c3, so instead White plays d6. Black has an equal choice of Pairs to complete, selecting f4 (c5 being just as good). White takes the cheapest corner, as it is a bit early to play outside the centre. Black again has two equal moves, to complete a Pair at c5, or fill a corner at c3. Black choose c3. White Corner at f3, Black fills Pair at c5, and White completes the shape at c6, as per diagram 2. Black now has only four real choices, as four more are symmetrical, and one gives away a corner. This opening was played by John Parker in the 1981 British Championship to win the final game.

Now look at diagram 3. White played the Desert, Black filled the Pair at f4, White had no choice by symmetry, then Black again filled a Pair at e6, White then played at d3 — taking three pieces.

Why? I don't know. But Maruoka, a world champion from Japan beat many national champions with it. Where would you reply? c4? e2? g4? g5? Confused? Good, because now you know about as much on Othello openings as anyone.

Figure 1.

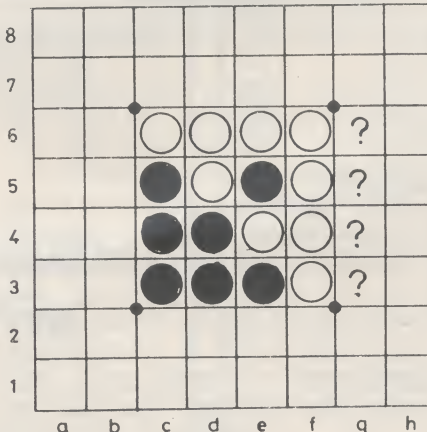
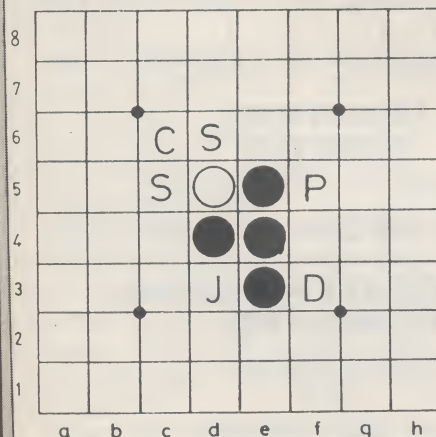
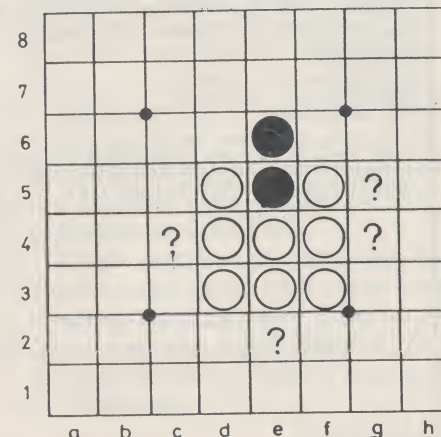


Figure 2.

Figure 3.





AND THE DRAGON

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P r o j e c t s

MAKING MORE OF YOUR MICRO

Is there life after Kit Korner? The answer from this end is a definite yes. It of course depends on whether or not you are interested in developing new ideas for your computer.

Certainly the technical requirement will not be any more than for the other kits I have already covered. In fact that should be the least of your worries.

You may naturally feel that it is not worth the work involved and decide to buy in a ready built version. In some cases, though, these will not exist, and as I have always said it is far better to build your own as you will learn much faster.

Most of the first few designs I have lined up are based around a single i.c. The reason for this is that they are quite easy to adapt for various micros and are simple to put together.

Later on as I develop new ideas I cannot say what might happen. We will just have to wait and see. As a result of this new expansion there will be far more circuit diagrams and layouts than there have been in the past.

I have always believed that a circuit diagram paints at least a thousand words and is far more informative. Some of the peripheral boards will have some short routines to get you started but the major development will be up to you, as will the use to which you put the board.

Many months ago I took a look at a programmable timer chip, the 6840. I had for a long time wanted to have a go with one just to see what I could manage to do with it. I was pleasantly surprised.

Many of you may already have used interface i.c.s in machine code and fortunately this acts very much like one. It gives you the facility of defining outputs with a certain time lapse or for repeated outputs at set time intervals.

I used the chip first to flash up

lights just to see if it would work. Using all three outputs I could get quite a good random flash and flash length with a little logic and some mains relays.

The 6840 is a Motorola i.c. designed for the 6800 system, but will work as well with the 6502 or, with a little help, on any eight-bit machine. It needs machine code to run it or an eight-bit output port in basic or an operator who can use machine code from Basic.

Not everyone will use the same method so I will demonstrate how it works in machine code and then leave it up to you to put the finishing touches to the program. The same goes for the other peripheral boards which I will design for you. You might even like to submit your own versions of the program for scrutiny.

The other i.c. I am interested in developing further is the priority interrupt controller, the 6828. It looks like one of those white



elephants which you don't often see but which you think you could use if you only knew how.

I will be looking into some of the more interesting possibilities of interfacing to which this i.c. can be put. Interactive games controller for one.

One of the problems with this particular i.c. is that it requires a little more software to drive it, so this may be a case for some more instruction than usual.

You may be asking yourself the

question, why am I picking 6800 peripheral i.c. projects rather than the more common versions, say 6502 or Z80. Certainly there are just as many i.c.s in their sets as any others.

The main reason is that I have been working for some time on 6800 systems and hopefully know a little of how they work.

Also, 6800 and 6502 peripherals are almost interchangeable. Although Z80s are very common these days for micros they are very flexible in their acceptance of other system i.c.s. This makes the use of 6800 peripherals almost ideal for the job.

If you find any others which you think could prove interesting please do not hesitate to let me know. My articles often spring from other people's ideas.

Another idea I have been working on has been the development of a dedicated microprocessor system which would be capable of fulfilling many purposes but would take very little to build.

If you imagine a basic machine and then write down its components you will only come out with a handful. Processor, ROM, RAM, I/O, display and logic circuits.

What makes a micro so expensive? Well mostly it is the bits you don't use to the full. By dedicating a micro to a particular use you are not wasting anything. Unfortunately you will not be able to use it for very much else unless you change the ROM in it which luckily is not too difficult.

As well as being relatively cheap the whole micro will go on to one small board a little larger than Euro-card size. Ever heard of miniaturisation?

However much work is involved in the projects I will of course be showing you the best and hopefully the shortest cuts to getting your prototype to work well.

I hope also that you will help by sending me your own hints and ideas so that I can pass them on to other readers. It all helps in the learning process, which is what we are here for.

Keith Mott

WARPATH PART II — BITS AND PIECES

```

90 IF C=0 THEN POKEL,K:POKEL+1,0:RETURN ELSE POKEL,256+K:POKEL+1,255:
RETURN
260 WD=WD*W2-INT(WD*W2):WN=INT(WD*R3)+1:RETURN
780 DIMH(10),PC(50,2),SV(6),VF(6),RF(6,2),X$(20),D(30),KB(1),KS(
1),KT(1),KV(1),KO(1),N(1)
800 GOSUB430:W2=997:INPUT"ENTER SCENARIO NUMBER":SC:IF SC THEN WD=S
C*.5284163 ELSE S800
810 GOSUB430:INPUT"HOW MANY BOULDERS":MT
821 GOSUB5200:GOTO2500 'DELETE LATER
860 RETURN
950 H(1)="ABC":H(2)="DEF":H(3)="GHI":H(4)="JKL":H(5)="MNO"
960 C5="ABCD"
970 RESTORE:FORI=1TO2:FORJ=1TO6:READK:RF(J,I)=K:K=K-256*(K<0):PO
KERW,K:RW=RW+1:NEXTJ,I
980 RESTORE:L=27544:FORI=1TO12:READK:GOSUB90:L=L+2:NEXT
990 L=27532:FORI=1TO6:READVF(I):K=VF(I):GOSUB90:L=L+2:NEXT
1000 D(2)="ABC":D(3)="DEF":D(4)="GHI":D(5)="JKL"
1010 D(7)="ABC":D(8)="DEF":D(9)="GHI":D(10)="JKL"
1020 D(12)="ABC":D(13)="DEF"
1030 D(14)="GHI":D(15)="JKL"
1040 D(17)="ABC":D(18)="DEF"
1050 D(19)="GHI":D(20)="JKL"
1060 C3="ABCD"
1070 C4="3332211113332211113332211114443211114444311115555561115
5555561155555556155555556"
1080 GT="ABCDEFGHIJKLMNPOQRSTUVWXYZA"
1090 T$="...TROOPERS":I$="INDIAN":E(0)="DEFENDER":E(1)="ATTACKER"
":E(2)="ELIMINATED":D=D(5):RETURN
1120 FORV=10TO16:POKEI,195:GOSUB440:U=I+1:P=X:GOSUB190:I=I+4:NEX
T
1130 V=16:GOSUB440:B7=X:POKEI,195:U=I+1:P=X+9:GOSUB190:I=I+3
1150 V=4:GOSUB440:E4=X:U=X+36:P=S9+1:GOSUB190
1180 DATA-24,24,48,23,-25,-48,-23,25,48,24,-24,-48,-60,68,128,6
0,-68,-128
2510 IF ML>2000 THEN PRINTH(RND(3));
2512 IF ML<1700 THEN PRINTH(RND(2)+3);
3099 DATA CHARACTERS
3100 DATA 158,148,094,158,148,135,171,142,148
3110 DATA 190,148,128,176,181,144
3120 DATA 184,159,175,180
3121 DATA 156,148,128,152,144,128,144,144,128,128,128,128
3122 DATA 170,140,148,170,140,148,168,184,144,160,160,128
3123 DATA 188,148,128,184,144,128,176,144,128,128,128,128
3124 DATA 176,180,144,160,180,128,160,176,128,128,128,128
3129 DATA 152,185,182,164
3130 DATA 143,143,143,143,140,140,140,140,143
3140 DATA 191,191,128,128,128,128,128,128,128,191
3150 DATA 191,143,140,140,140,140,140,140,188
5198 '
5199 'GRAPHIC LOADER
5200 CLS
5205 RESTORE
5206 READM$:IF M$="" THEN "CHARACTERS" THEN 5206
5210 FORI=1TO5
5220 X=PEEK(VARPTR(H(I))+2)*256+PEEK(VARPTR(H(I))+1)
5230 A$=H(I):GOSUB5400:NEXTI
5231 X=PEEK(VARPTR(C5)+2)*256+PEEK(VARPTR(C5)+1)
5232 A$=C5:GOSUB5400
5240 FORK=2TO17STEP5
5250 FORI=KTOK+3
5260 X=PEEK(VARPTR(D(I))+2)*256+PEEK(VARPTR(D(I))+1)
5270 A$=D(I):GOSUB5400:NEXTI,K
5280 X=PEEK(VARPTR(C3)+2)*256+PEEK(VARPTR(C3)+1)
5290 A$=C3:GOSUB5400
5320 X=PEEK(VARPTR(GT)+2)*256+PEEK(VARPTR(GT)+1)
5330 A$=GT
5400 FORJ=1TOLEN(A$):READM:POKE(X+J-1),M:NEXTJ:RETURN

```

WARGAMES need opposing forces, armed and ready for battle. In Warpath the conflict is between the cavalry's General plus his troopers and the three types of Indians: those armed with tomahawks, the bowmen and the horsemen.

The conflict must be carefully balanced to give both sides an equal chance of victory and this is achieved by different numbers of each piece with various movement and attack/defence advantages.

In wargames like chess, there is no problem with preserving a balance in the game as both sides are made of the same pieces in the same position.

This leads to chess experts being able to develop rigid opening formations which have been proved and used many times before.

Warpath sets out two very different looking sides which will be in a new formation each time you come to play the game.

Remember: if you have any difficulty following Warpath on your computer please write in and let us know.

By the way, the machine language is written in Z80 code. I would like to hear from anyone who successfully implements the program in 6809 or 6502 code. There are no ROM calls.

The Warpath game pieces are as follows:

Field	Troopers	Number	Movement	Attack/Defence
	General	14	3	1
	Flag	1	4	2
Garrison	Troopers	9	See below	0
Indians	Bowmen	8	3	1
	Tomahawks	8	4	0
	Horsemen	8	6	1

When the board is set up, the Flag will be in the hex occupied by the General. Any piece occupying the Flag hex will receive an extra movement factor provided that it is in that hex at the start of its move. A trooper who is adjacent to the General receives an additional attack/defence factor.

Last month we developed the BIG-SCREEN routines for WARPATH; now let's look at the creation of the pieces. The method is similar to the machine language routines but this time we build up graphic characters.

Characters can be created using the CHR\$ instruction. For example: a man H(1), could be defined as:
H(1)=CHR\$(158)+CHR\$(148)+CHR\$(094)

But this takes up 20 bytes of memory. (Count it. Remember that CHR\$ only occupies one byte.) Lines 3100 to 3150 contains 98 items of DATA so if we use this method it would probably cost about 650 bytes. If we POKE the data into strings, however, it will require no more than the length of the strings defined in lines 950 to 1080 (excluding 1070), i.e. about 150 bytes — a saving of 500 bytes. It was only by adopting these methods that I was able to fit this game into 16K.

Incidentally, whilst on the subject of byte-grabbing, let us look at line 1070. This contains C4 which is a table of ODDS with 81 numbers none of which is greater than 6. I could have defined an

integer table and put the numbers into that, but this would have required two bytes per number and, in addition, I would have needed more DATA lines and the necessary programming to set the table up.

I estimate an extra 200 bytes would have been needed to do this, quite apart from the additional time delay. Accessing the string is done using MID\$ and VAL. You should always look for these savings.

Full marks if you have seen that I could have made the table smaller by putting 3 numbers in one byte (because 6 to the power of 3 is less than 255, the capacity of one byte).

Now back to the pieces. There are several different types:

1 The men are represented by the variables H(1) to H(5).

2 Boulders are held in C3 and the Headquarters piece is held in C5.

3 A major part of the Fort is in GT.

4 D(2) to D(20) are the elimination routines and operate like a filmstrip. I find explosions very difficult to define authentically, so in these sequences I push the man into the ground!

The TRS-80 graphics are very simple. The video has 16 rows of 64 blocks and each block contains 6 pixels numbered as fol-



12 bytes by using the DIM statement.

Line 790 asks for a scenario number. All my games have their own random number generator which is seeded with this number. This enables players to replay the same map layout, either because they wish to reverse sides and play under the same conditions or because they discover a particularly interesting set up. The seed, WD, is calculated from the scenario number. When a random number is needed between, say, 1 and 6, R3 is set to 6 and the generator, line 260 is called. The variable, WN, returns the random number and WD is reseeded. Note that W is defined as Double Precision. Once the board has been set up, I use the Basic random number generator to determine the outcome of attacks.

We now call the initialising routine at 1100. Lines 1100 to 1160 prepare the machine code routines by setting up the JUMP table (variable RU).

Do you find this table confusing? Some of the routines call subroutines just like GOSUB in Basic. For example, the routine in X\$(1) calls X\$(2). Strings, however, tend to move around in memory during program development and therefore the address of X\$(2) will change.

WARPATH

Lead the cavalry charge or plan the Indian ambush. Part II of Ron Potkin's series which combines advanced programming tips with a listing which builds into a thrilling wargame. This month, Ron looks at the pieces.

lows:

1	2
4	8
16	32

To this you must add 128. H(1) — the bowman is made up of 158 and 148, i.e.

2	
4	8
16	16

CHR\$(094) is an East pointing arrow. Many computers do not have this character — I suggest you replace this with the "Greater than" sign (ASCII 62).

Before you start typing, LOAD the program from last month. Now add the Basic listing below. This contains a graphic loader. Make sure you type lines 950 to 1080 exactly as they appear. You should also type the change in Line 821.

Make sure you save the program before running it; there are several POKE and you easily ruin it with a wrong instruction. Incidentally, always save the updated listing onto a new

tape. If anything does go wrong you can always fall back on the previous month. Now type RUN and in answer to the questions, "ENTER THE SCENARIO NUMBER" and "HOW MANY BOULDERS?", type any low number — these are unimportant at present.

After all that hard work, I expect you want to see some action, but we can't do much yet. The subroutine at Line 860 includes those lines necessary to put the pieces on the map, but before we can do this I must explain two more arrays, PTABLE and IBOARD. These will be the subject of next month's article. In the meantime, lines 2510 and 2512 have been adjusted so that the men will be printed in the BIGSCREEN. This will probably create as many Generals as Troopers but it will give you an opportunity to see the results of your efforts.

Line 780 dimensions all arrays. Make sure you include even the small ones, KB, for example, only uses KB(0) and KB(1), i.e. 4 bytes. You can save about

Although I can calculate this and POKE it into X\$(1), I risk poking either a zero or 34 into the Basic line which would ruin the program. Instead I have created a table whose address is fixed and which can never contain 0 or 34. The address of X\$(2) is poked into this together with a JUMP instruction. This enables X\$(1) to call the table which in turn jumps to X\$(2).

The problems with zero and 34 occur with the TRS-80 using Microsoft Basic. Zero is used to signify to the interpreter the end of a Basic line and 34 is the quote character signifying the end of a string. Other computers using different interpreters may vary. On the ZX81 the number to avoid is 76.

I have created variables which are entry addresses to the USR routines, i.e. B1 — X\$(1) address for BIGSCREEN. B4 — X\$(4) address for SEARCH. B7 — X\$(16) address for RANGE.

X\$(3) is the CLEAR routine. It is used in Line 1160 only. Next month we will examine PTABLE and IBOARD.

Two more spell-binders from I

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But they didn't say I'd have to stop and control not just one but two or even more garbage pods. Then prod them, push them, toward that black hole, and oh, it's so very, very black, and so lonely, so empty.

Panic, musn't panic, but they won't stop, twirling and spinning

and turning, always turning, towards me, against me, at me.

And I'm alone.

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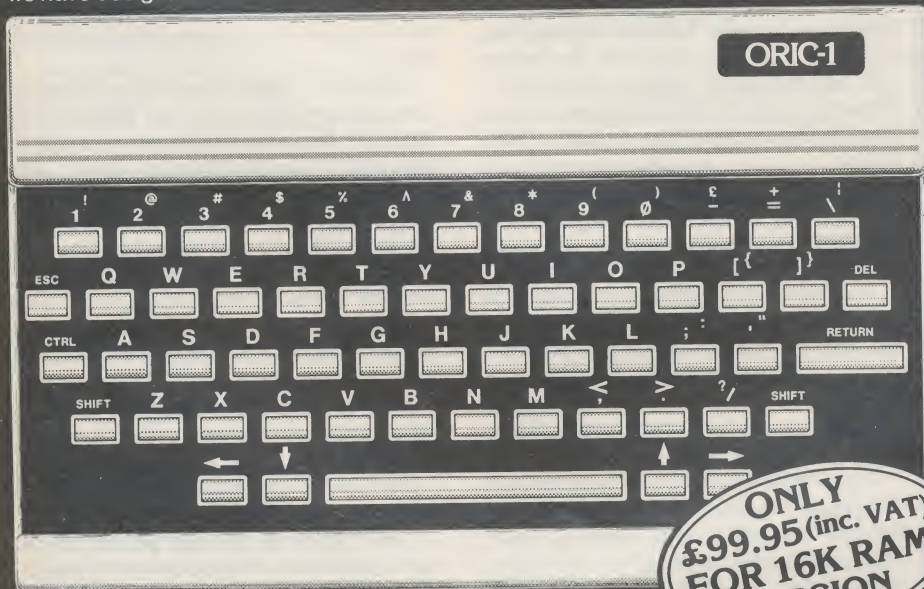
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BOLDLY GOING WHERE OTHERS FEAR TO TREAD

STAR RAIDERS

Star Raiders was generally acknowledged as being a "state of the art" computer game when it was launched last year.

This jargon term simply means that in terms of quality of graphics, playability, and game development the cartridge is the best that present technology has produced.

The game puts you in the cockpit of an Atarian Federation star cruiser chasing the enemy Zylons through space.

By pressing a button on the computer keyboard a map of the galaxy is displayed. This shows the position of enemy ships and star-bases in relation to your craft.

There are three types of ships to be dealt with. Zylon Fighters are designed for high-speed attacks and can be deadly at close range.

Zylon Cruisers have assigned patrol routes within certain sectors and will only attack if provoked. Basestars can only be destroyed at close range. Use extreme caution when attacking a Basestar.

As well as enemy ships you will also have to avoid the masses of meteorites that are spinning through space.

To aid you in your mission you have a number of sophisticated battle and flight control instruments. Computer Attack Control flashes up gun sights on the screen and enables you to lock on your photon torpedoes, but the Galactic Chart is your most useful aid in your pursuit of the Zylons.

This shows you the entire galaxy divided into sectors containing either enemy starships, friendly starbases, or are completely uninhabited.

The Hyperwarp enables you to travel at accelerated speed to different sectors and the long range scan shows you the positions of approaching enemy fighters.

You can work your way up through the ranks of the star fleet while you play. Some of the ranks will amuse you.

Once this has been achieved the real fun can begin as you work your way up through the ranks from rookie to Star Commander. The good thing about the game is that it is pretty tough to win this top rank rating.

Star Raiders is available from most good Atari dealers at £29.95. Not cheap — but an excellent addition to your games library never the less. It runs on an Atari 400 and 800 with version also available for the VCS.

● Getting started	9
● Value	7
● Playability	8



BEWARE OF THE DEADLY BALROG

SORCERERS ISLAND

Once marooned on Sorcerers Island your only hope is to find the hidden escape route.

Numerous hidden beasts will try to stop you and take your life during your quest for the lost exit. Some are easy to deal with — but the dreaded Balrog will show no mercy.

You start this adventure with 2,000 life points which decrease as you battle with various monsters to collect the treasures you find along the way.

After each move you are a map of the island is available for your perusal — and you can also check out the spaces immediately next to your present position. Unfortunately neither show the exit or the monsters.

Sorcerers Island is one of two adventure games for the ZX81 from Psion.

The other — which also requires 16K to run — is Perilous Swamp. This is the easier of the two games. You have to rescue a princess from an evil wizard. There are more monsters and lots of action. I recommend you try Perilous Swamp first — I've yet to solve Sorcerers Island. If you like adventure games then this cassette is well worth the price of £4.95.

● Getting Started	7
● Value	7
● Playability	7

BUGGIES WILL SIMPLY DRIVE YOU CRAZY!

BAJA BUGGIES

This is very much like the VCS game Night Driver. But Gamestar, the new American Atari software company who released this new game have made full use of the superb graphics of the Atari computers.

The scene is set in the Californian desert. Sand-dunes lurk at the top of the screen with a golden sunset on the horizon.

The object of the game is to win the race. But as you start last there are 80 buggies in front of you! Your speed accelerates automatically and when you press the fire button your brakes go on. You have to slow down or you will lose control.

At the bottom of the screen there is a control panel. This shows your speed, your

position in the race. There's a radar scan which shows how far you are from the finish line. The radar also shows where the leaders are.

If your average speed is better than the speed already on the scoreboard you get a chance to put your initials up. If you wish to join the Baja Buggies Club you must take a photo of your initials to the manufacturers. In return they will send you a key-ring and membership card.

One of the annoying things with the game is that if you crash your buggy too often or go off the road too often your buggy will break-down and the game is over. Graphics wise buggies could be better. The sounds are also pretty poor in comparison with games like Preppie.

This 16K game for the Atari 400/800 was good fun to play but overall it was rather disappointing. Baja Buggies is available from Gemini Electronics of Manchester at £19.95.

- Getting Started 6
- Value 7
- Playability 6

DINING OUT WITH THE GHOSTS

A stack of Pacman-type games have been cluttering up the C&VG reviews office over the last few weeks. A new maze gobbling game is added to the list of software available for the Spectrum at the rate of about one a week.

We tested a batch of the more obvious straight copies of the arcade original.

First on the screen was Spookyman from Abbex Software of London.

This game got off to a bad start as it did not tell me which keys to move my little man around the maze. A prime consideration in this game!

Although the maze looked fairly good the Pacman somehow failed to convince. It just didn't feel like controlling a little chap with a personality of his own.

Having just borrowed an Atari 400 with a Pacman cartridge I was used to much better player involvement in the game.

If you got caught by one of the ghosts the game paused for an annoyingly long period. There is also an absence of shrinking and gobbling sands and the characteristic gulp, gulp, gulp as you clock 200 then 400 and 800 in the arcade original.

Next up was Mazeman from Abersoft of Dyfed. This was the fastest and most playable of the pile but this too left a little too much to be desired.

The game produced no sound effects, bonus fruits or flashing ghosts.

All of the games would have been greatly improved by the use of a joystick. Playing Pacman without a joystick is rather like Blackpool without the illuminations.

Based on Pacman but with a few twists

SPECTRUM PACMEN

of its own was Gulpman from Campbell Systems of Essex. This game offered thorough instructions with a comprehensive list of game options.

You could choose one of fifteen mazes and vary the speed of your little man and the chasers.

Another interesting variation on the basic Pacman theme was a laser-gun with a limited amount of energy with which you could shoot the chasers.

On the minus side Gulpman has pretty basic graphics. The Gulpman for example moves around the maze without moving his legs. It would have been more convincing had the program simulated some sort of running motion.

Artic Computing of Hull also produce a Pacman-type game called Gobbleman, which I believe is a fairly close copy of the arcade game. I cannot give you my comments on this game however as it steadfastly refused to load on my Spectrum.

I was not over impressed with any of these versions. I don't know if it's the software or the machine but frankly Spectrum Pacman is not a patch on its Atari and BBC model B counterparts.

But if you really want a Pacman for your Spectrum, Gulpman just pips Mazeman. You might be better advised going for some of the original maze chase games.

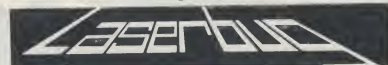
- | | Spookyman | Mazeman | Gulpman |
|-------------------|-----------|---------|---------|
| ● Getting started | 6 | 8 | 9 |
| ● Value | 5 | 6 | 6 |
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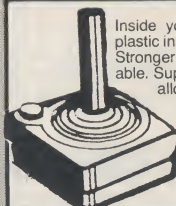
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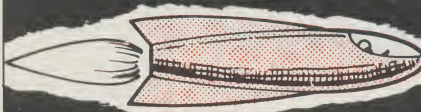
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continued on page 114 ▶

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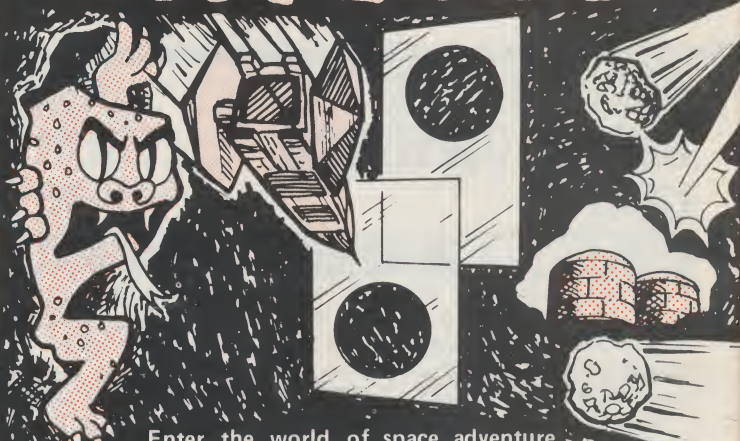
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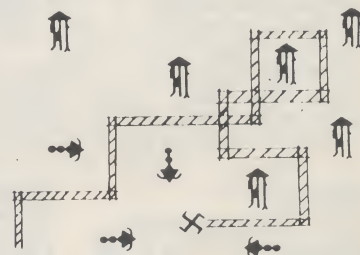
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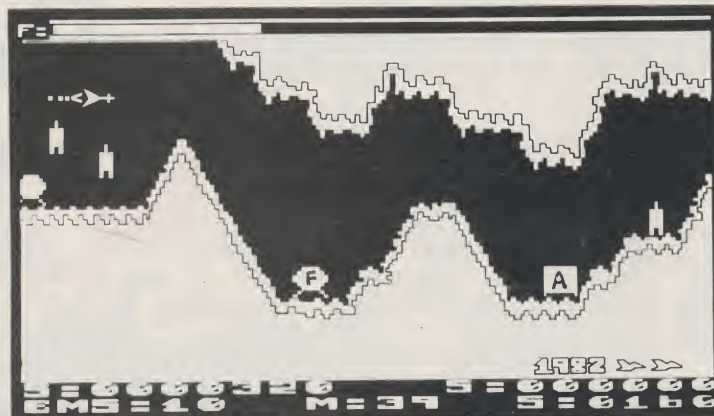
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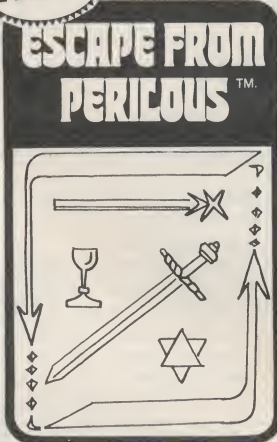
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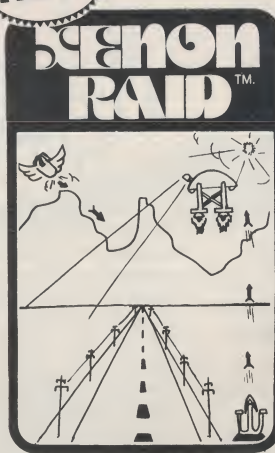
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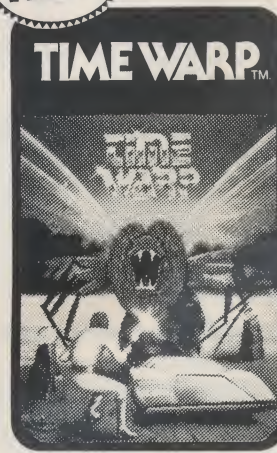
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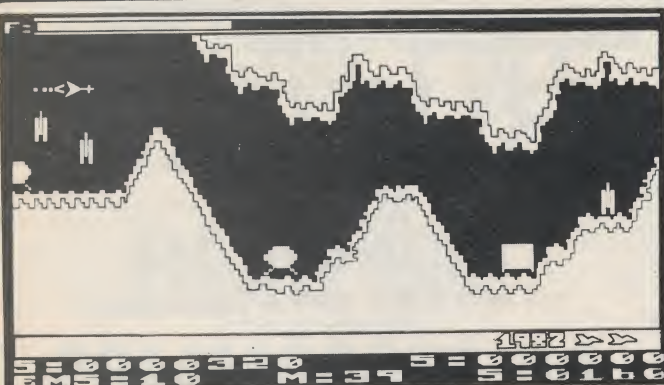
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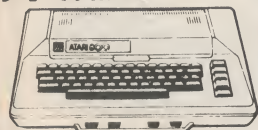
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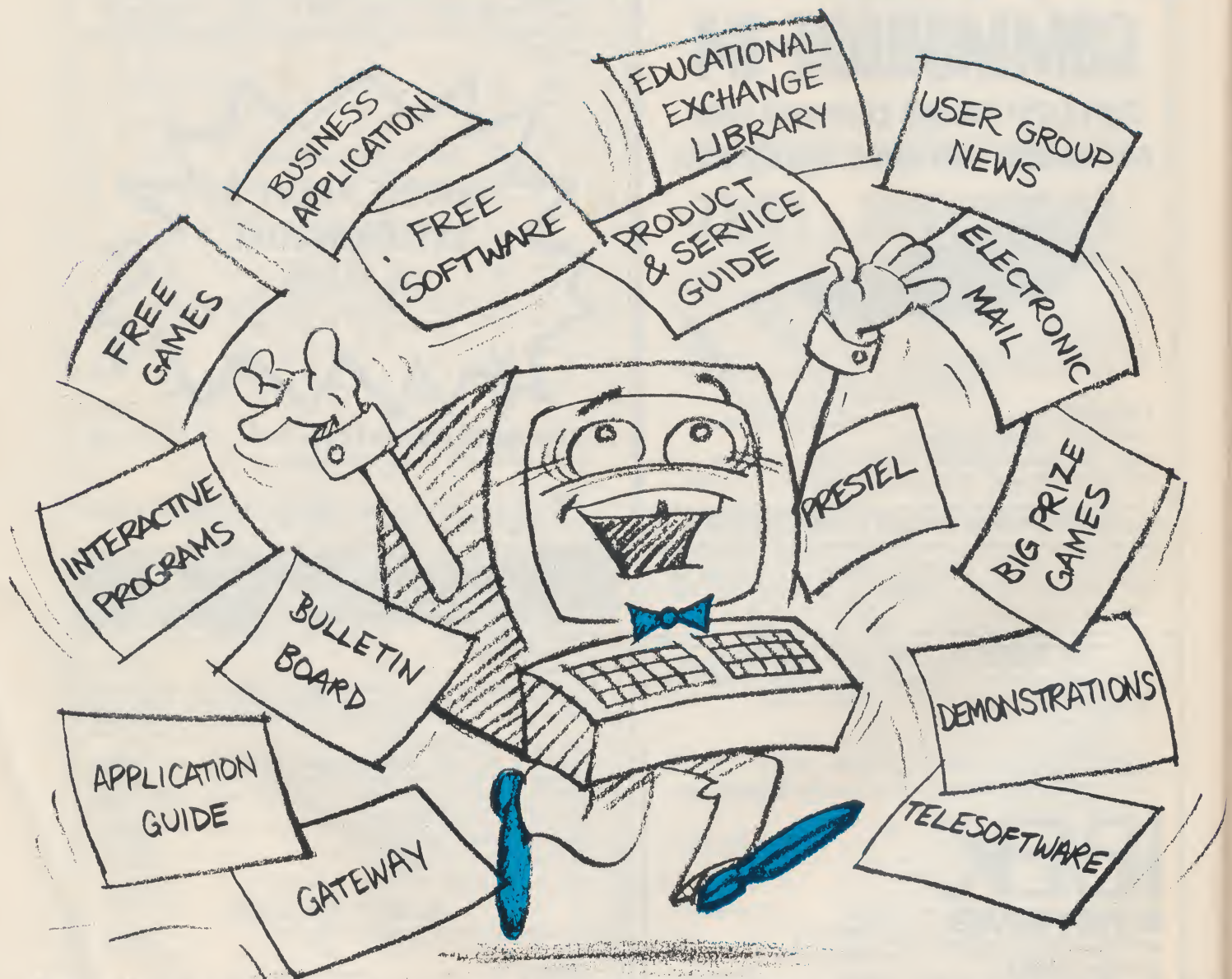
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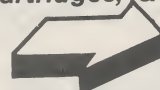
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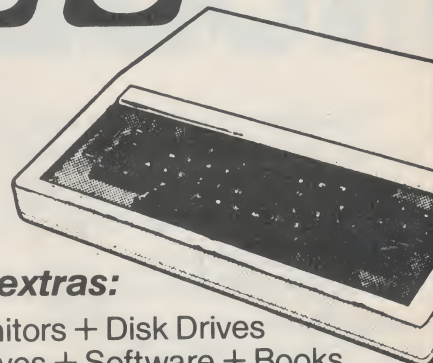
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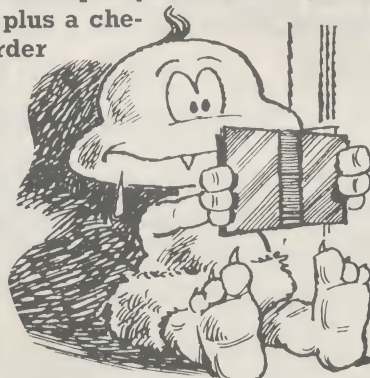
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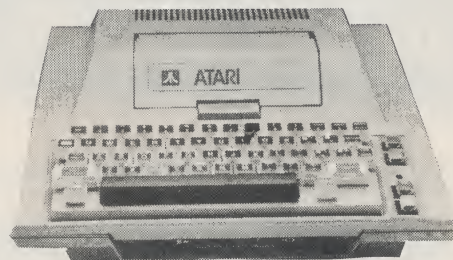
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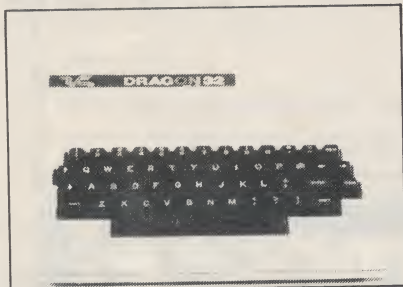
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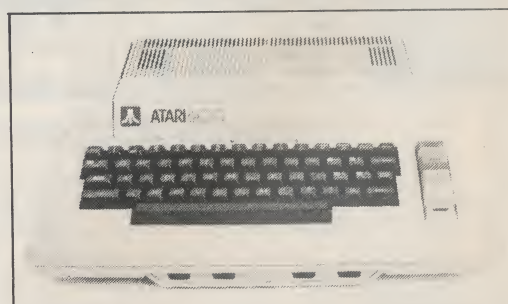
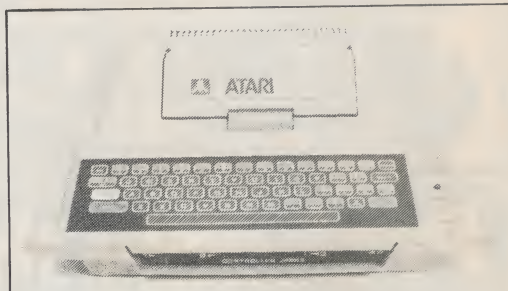
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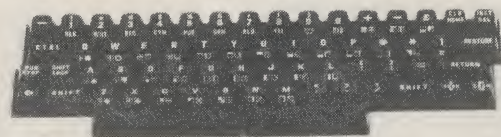
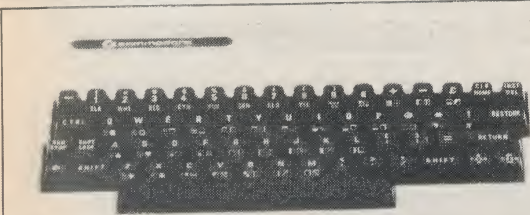
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Star Raiders	-1E-8K-YG66W £29.95
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CREDIT

Dragon 32 computer hardware

(Subject to approval
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Game Programs

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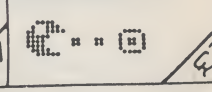
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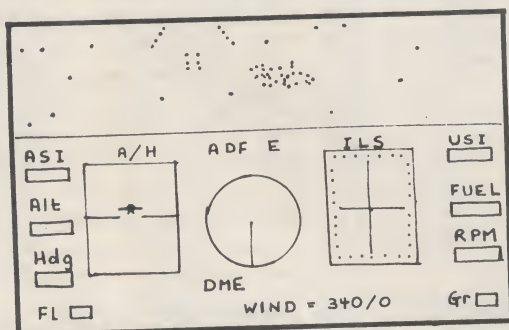
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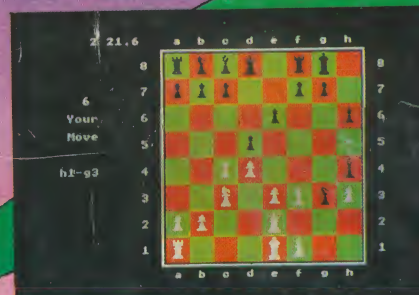
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